QUALITY MANAGEMENT IN HONG KONG'S CLOTHING INDUSTRY

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ABSTRACT

This report focuses on the Hong Kong's clothing industry, analyzes the details of the research about quality and productivity improvement practices in local clothing manufacturers and covers the comparison of these research findings in clothing industry with that of Hong Kong manufacturing industry.

The objective of this research is to study the "Quality Improvement Techniques" and "Productivity Improvement Techniques" currently adopted by and their correlation to the quality and financial performances of Hong Kong's clothing industry.

The approach of this research is by means of a questionnaire and interviews. Respondents of the questionnaire are the practitioners in the clothing industry. Interviews are held with the Hong Kong Government Industry Department and two Hong Kong clothing manufacturers.

Findings of this research are generated by means of SPSS/PC+ System Factor Analysis. The details of these findings are stated in Chapter IV.

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PREFACE

The competitive nature of the clothing industry has created a market-directed trading climate whereby the Hong Kong's clothing manufacturers are left with no option other than to produce top quality garments to maintain their operations. On the other hand, profit margins are being squeezed by rising materials costs and labour wages, it is believed that the manufacturers which have made significant investments in modern technology, productivity and quality improvement are able to withstand competition and survive.

The purpose of our studies is to identify the extend and what types of quality and productivity improvement techniques currently adopted by the local clothing manufacturers and to analyze if the implementation of these quality and productivity improvement techniques can upgrade quality standards, improve productivity and financial performances of the clothing manufacturers.

It is interesting to find out that despite people generally believe in hard and soft technology to improve quality standard and performance, more than half of respondents in our research apply no formal approach in quality improvement and only 27 percent of respondents apply contemporary computer-integrated manufacturing

systems. These figures are below the average figures of Hong Kong's overall manufacturing industry.

The result of our research implies that the local clothing industry is still labour-intensive with relatively little investment in modern soft and hard technology. One slight limitation of our research is that we are not able to derive a statistically significant correlation among implementation of quality and improvement practices and performance improvement in finance, productivity and quality based on 54 responses out of 337 questionnaires sent. However, the major accomplishment is that we have gone through a comprehensive and valuable exercise of primary research in collecting, comparing and analyzing of raw data.

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A special mention of appreciation must go to Mr. Andrew Chan, Managing Director of Hinbase Limited and Ms. Cammy Ng, the Senior Manager of Glorious Sun Group. They kindly grant us the interviews and provide us with insightful information about their daily quality control practices and company's strategies in quality and productivity improvement.

Finally, we would also like to express our appreciation to those clothing manufacturers and industry practitioners who returned the questionnaires and provided us with valuable information about their quality and financial performance.

CHAPTER I

HONG KONG'S CLOTHING INDUSTRY

Historical development

In 1950, there were only 41 clothing factories employing 1944 persons. They accounted for 2.8% of total manufacturing establishments and 2.4% of total manufacturing employment. Beginning with the early exports to the UK, the Hong Kong clothing manufacturers were regarded as "Original Equipment Manufacturers" and suppliers of "bargain basement", simply focused on lowest production costs and produced to specifications provided to them by domestic trading companies or foreign buyers.

For the past 35 years, the number of clothing factories increased by an annual average rate of 25%, reaching the peak of 10,556 in 1987. Employment in the clothing industry also reached a peak in 1986 with 299,932 people accounted for 34.5% of all those in manufacturing employment. Since 1987, both the number of establishment and employment started declining constantly on an average rate at 7%. Establishment was down to 6,980 units and employment was to 186,609 people in 1992.

At the same time, clothing manufacturers gradually developed from the low risk original equipment manufacturing and limited exporting to increasing commitment in international trade through sales and services abroad, development of own brand names and production of higher value added clothing domestically and overseas. In recent years, the clothing industry has moved upmarket and established its high quality fashion image. Hong Kong has become a reputable regional garment sourcing centre attracting orders of both mass merchandises and of small quantities of high-priced fashion garments.

Global position

During the past decades, Hong Kong clothing exports developed rapidly and enjoyed prosperous growth by continuous increase in domestic exports, rapidly growing re-exports and control of manufacturing and exports in every continent. In 1992, Hong Kong total exports was at US$20.1 billion, became the world leader, ahead of China and Italy in manufacturing and exporting clothing products and accounted 20% of total world exports of clothing (Fig. 1). The real challenge of the Hong Kong's clothing manufacturers will be to continue this leading position in the global clothing markets.

Fig.1 World's Leading Exporters of Clothing, 1992

COUNTRY	Value (US$ Billion)
HK - Domestic Export	10.00
HK - Re-Export	10.10
China	16.70
Italy	12.20
Germany	8.40
South Korea	6.80
France	5.30
USA	4.20
Taiwan	4.10
Others	22.20
Total	US$ 100.00Billion

Source : James Glasse, "Hong Kong's Textile and Clothing Industry: Prospects to 1997 and Beyond", Textile Outlook International, May 1994.

Domestic Position

The clothing industry has been the largest manufacturing sector in Hong Kong for the past thirty-five years. Almost 90% of the Hong Kong clothing industry's output is exported. Between 1990 and 1992, domestic exports increased by only 7% but started declining by 11% in the first quarter of 1993. Despite the fact that domestic exports of clothing are dropping, clothing industry are topping the lists in all major economic activities ,account for 32% of domestic exports, 34% of manufacturing employment in Hong Kong in 1990 and 14.2% of total exports by products in 1994 (Fig. 2).

Fig.2 Hong Kong's Total Exports by Major Products in 1994 (Jan-Sep)

Products	Percentage %
Clothing	14.20
Electrical machinery, apparatus & appliances	9.00
Telecommunications, sound recording & reproducing apparatus	9.20
Textiles	8.40
Toys, dolls & games	6.00
Footwear	4.80
Office machines & computers	4.40
Watches & clock	3.40
Travel goods & handbags	2.80
Plastic raw materials	2.70
Others	35.10
	100.00

Source : Hong Kong Trade Development Council, "International Market News" Vol 115. 1995

A promising growth in re-exports to and from China will help boost Hong Kong clothing industry, even part of the expected increase will be likely offset by the continuous decline of domestic exports (Fig. 3). In the first quarter of 1993, there was a noticeable downturn in domestic exports and for the first time, the value of re-exports exceeded domestic exports in every product category while total exports edged ahead 2%. This situation is likely to continue reflecting that the long term prospects of clothing industry will be increasingly depended on the growth and development of re-exports and Hong Kong's position as a major garment manufacturer will further reduce.[1,2]

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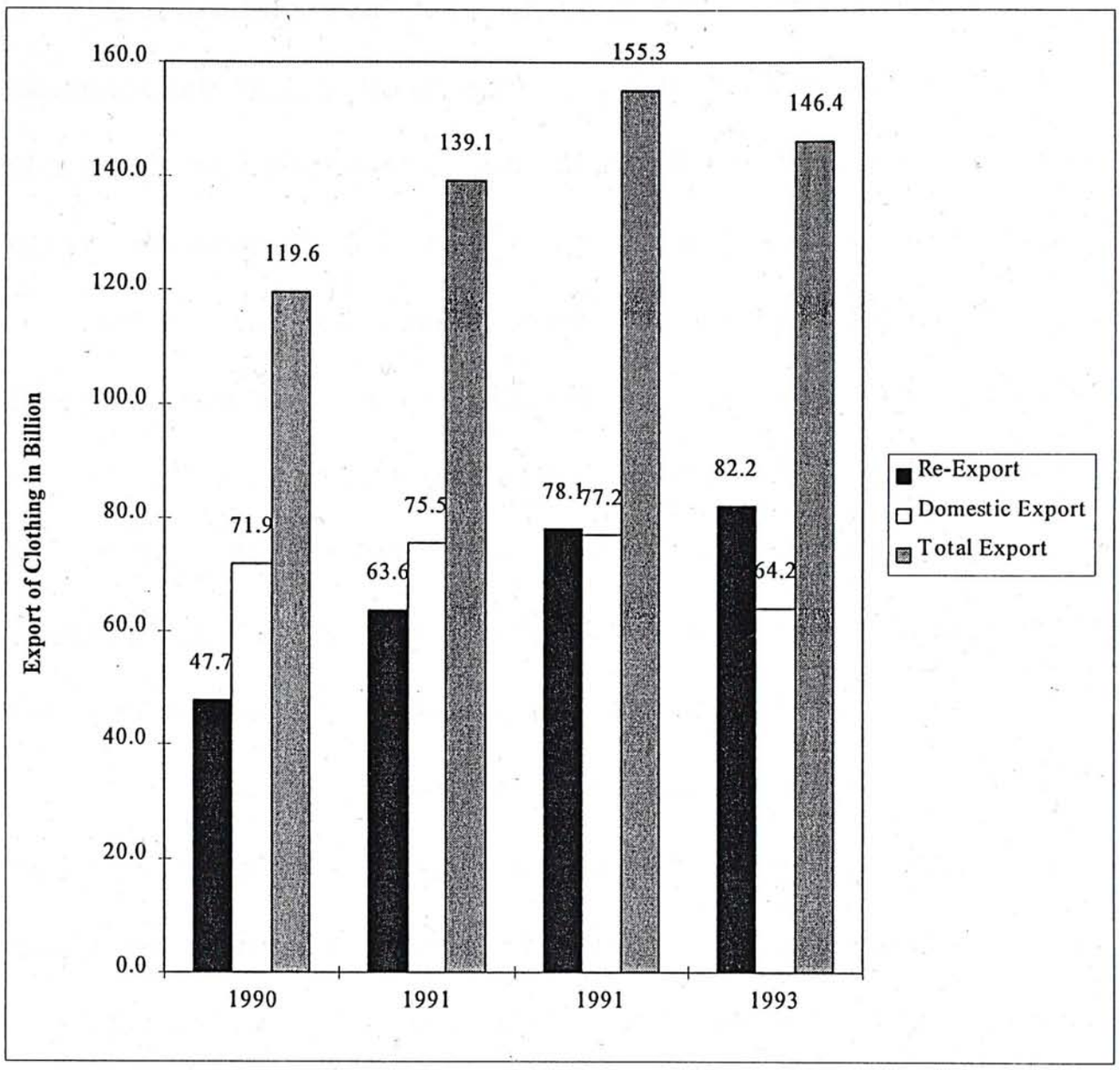
[1]Trade Development Council, " Hong Kong's trade outlook for 1995" International market News, Vol.115,1995

[2]James Glasse, "Hong Kong's Textile and Clothing Industry: Prospects to 1997 and Beyond", Textile Outlook International, May 1994.

Fig.3 Hong Kong's Total Exports of Clothing



Source : Peter Milliken, " Hong Kong's Domestic Garment Industry Declines in 1st Qrt.",Inside Fashion,July 1-15, 1993.

Structure

The traditional role of Hong Kong manufacturer was to manufacture only, Hong Kong's part of the value chain in clothing manufacturing was limited to the "making cost" which accounted for 6.45% of retail price.(Figure 5).

Within manufacturing costs of the clothing industry, labour costs as a proportion of total production costs was at 20% in 1991 which was still above the industry average at 18.3%. Also the value added per person engaged in clothing industry was HK$ 102,000 per annum that was 28% lower than industry average of HK$ 142,000.

All indicate that the clothing industry is still relatively labour-intensive and the industry rested on the basis of low-cost labour as a key competitive factor.

Recently, the percentage of labour cost to total production costs dropped from 25.3% in 1985 to 20% in 1991 indicating that there might be a growing investment in labour saving equipment or an increase in productivity of labour input(Fig. 6).

Figure 5. Breakdown of Value Chain in Clothing:
from manufacturing to retailing

Item	% of Retail Price	Added Value incurred	
		Country	firm
Manufacturing costs:			
Fabric	12.64	foreign	supplier
Other Materials	1.86	foreign	supplier
Labour-making cost	6.45	HK	clothing
Support costs			
- design	0.10	HK	clothing
- fabric sourcing	0.02	HK	clothing
- production control	0.02	HK	clothing
- customer liaison	0.07	HK	clothing
Other			
- profit and quota owner	1.60	HK	quota
FOB Price	22.76		
Sourcing costs:			
- merchandising firm	0.45	HK	trading
- design support firm	0.21	HK	trading
- quality control firm	0.27	HK	trading
- shipping & admin. firm	0.07	HK	trading
Freight, Duty & Misc.: firm	23.86	foreign	shipping
Retail Markup : firm	52.38	foreign	shipping
Retail Price	100.00 %		

Source: Hong Kong Government Industry Department," Techno-Economic and Market research Study of Hong Kong's Textile and Clothing Industry 1991-1992'. Page 101

Fig.6 Breakdown of Production Costs in the Clothing Industry,1981-1991

Year	Other Expense(%)	Labour Cost (%)	Material, Services (%)	Value added per person engaged (HK$'000) Clothing industry	other manufacturing industry
1981	9.20	22.50	68.30	31	36
1985	9.50	25.30	65.20	47	55
1986	9.30	23.80	66.90	54	67
1987	10.00	21.90	68.10	67	80
1988	9.70	22.30	68.00	74	94
1989	10.60	21.90	67.50	84	108
1990	11.20	22.00	66.80	91	121
1991	11.70	20.00	68.30	102	142

Source : Hong Kong Government Industry Department, "Hong Kong's Manufacturing Industries 1993.", page 48-49.

Factory classification

The clothing companies are commonly classified into the following two major categories by their final products, differences in usage of machineries and manufacturing processes of the garments.

- cut and sewn sector : fine gauge cotton knitted T-shirts
  : woven clothing such outer wears, jeans dresses and shirts etc
- knitting sector : woollen sweaters and other fibre sweaters

For simplicity and standardization, all the above factories are referred to clothing factories through out our study.

Number and Size of Establishment

Recently ,the size of the clothing companies were getting smaller and smaller. Before 1970, the average size of a clothing factories was around 45 workers. In 1989, over 65% of Hong Kong clothing companies employ less than 20 people whilst less than 5% of establishments employ more than 100 people (Fig. 5). However these 5% establishments generate more than 50% of total gross output of domestic production. The number of establishment dropped

significantly from 10,556 in 1987 to only 6,980 in 1992 reflecting a structural changes in both domestic exports, manufacturing sector and employment pattern in Hong Kong economy.

Fig.7 Number of Establishments and Persons Engaged in the Clothing Industry, 1950 - 1992

Year	No. of Establishment	No. of Persons Engaged	Avg No. of Persons engaged Per Establishment	
			Clothing Industry	All Manufacturing Industries
1950	41	1,944	47	55
1955	99	4,261	43	45
1960	970	51,918	54	41
1965	1,514	87,454	58	39
1970	3,491	158,025	45	33
1980	9,499	257,595	29	20
1985	10,307	292,789	28	18
1986	10,392	299,932	29	18
1987	10,556	298,377	28	17
1988	10,412	286,659	28	17
1989	9,672	274,732	28	16
1990	9,746	251,746	26	15
1991	8,837	224,925	25	14
1992	6,980	186,607	27	14

Source : Kurt Salmon Associates, " Hong Kong's Manufacturing Industries 1993", Hong Kong Government Industry Department, page 46 -49.

Labour

According to the survey report in the Techno-Economic and Market Research Study of Hong Kong's Textiles and Clothing Industries 1991-1992 on the labour force of Clothing Industry, a high proportion of the labour force at 75% was woman especially in operative levels (fig.8) and 70% was at 20-40 age range (fig.9). It created a serious problem of labour shortage in operative levels for the past twenty years as majority of female labourers quitted working when they got married and had children.

Fig. 8. Labour Force Profile - 1989

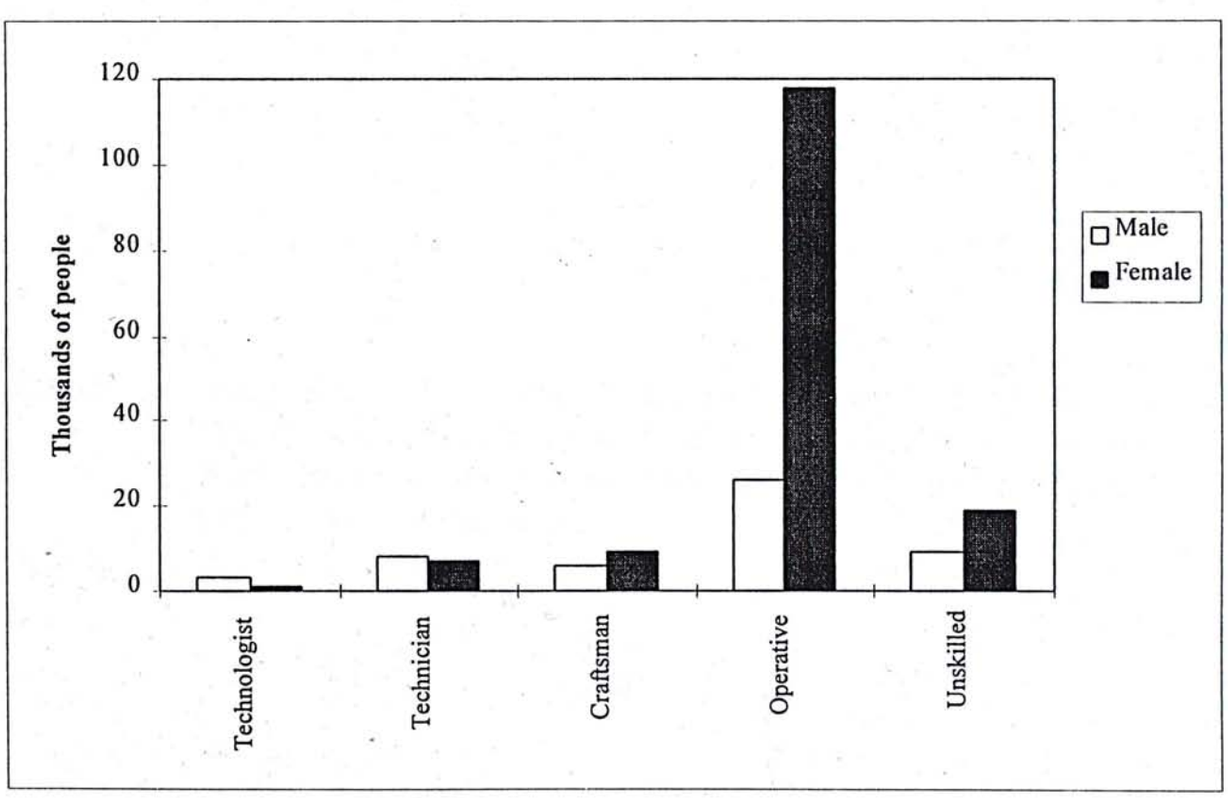
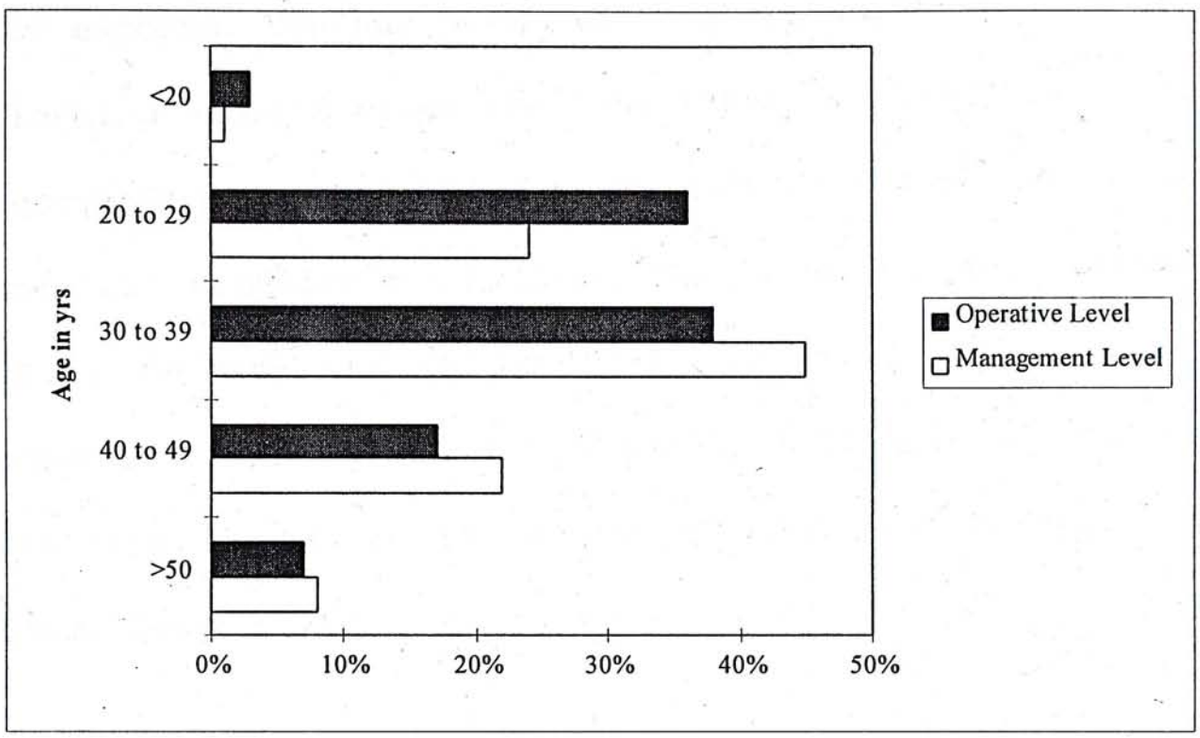


Fig. 9. Age Distribution of Employees - 1992
Management and Operative Level



Source: Hong Kong Government Industry Dept.
"Techno-Economic and Market Research Study of Hong Kong's Textiles and Clothing Industries 1991-1992 Page a17."

Market

90% of Hong Kong domestic production of clothing is for exports. USA has been the lead market for Hong Kong's clothing exports since the late 1950s. In 1992, USA alone absorbed HK$ 37 billion accounted 48.1% of Hong Kong domestic clothing production. The three largest markets, USA , Germany and UK total for 70% reflected a highly concentration of markets and heavily reliance of Hong Kong clothing manufacturers on the economic performance of these few importing countries.

Fig.4 Hong Kong's Export of Clothing by major markets in 1993

Country	Value of domestic export (HK$ M)	(%)	Value of re-export (HK$ M)	(%)	Total export (HK$ M) (%)
USA	30,554	47.6	29,358	29.6	54,912 37.5
Germany	8,662	13.5	8,550	10.4	17,212 11.7
Japan	2,358	3.7	11,676	14.2	14,034 9.6
UK	6,244	9.7	4,179	5.1	10,423 7.1
China	3,401	5.3	1,990	2.4	5,391 3.7
Others	12,998	20.2	31,468	38.3	44,466 30.3
Total	64,217	100%	82,221	100%	146,438 100.0

Source : Glasse, James, "Hong Kong Textile and Clothing Industry: Prospect to 1997 and Beyond", Textile Outlook International, May 1994.

Current Constraints

Increasing costs

Hong Kong's cost competitiveness is diminishing due to recent escalating land costs and labour costs. Rent increased quadruple and labour wages increased 110% in 8 year times from 1985 to 1992. Recently, the manufacturers are under excessive public pressure on fairly needed employee welfare programs which will impose a heavy cost burden on the small manufacturers.

Nearly 100% of all raw materials for clothing manufacturing, such as cotton, silk, wool, man-made fibre and other vegetable fibres are imported from China, USA, Japan, Korea, India and Taiwan. The total of productivity gains and increase in market price are not sufficient to offset increase in rent, labour wages and material costs.

Labour shortage

Clothing manufacturers encounter increasing difficulties in recruiting and retaining workers because of rapid expansion of clothing industry as well as the blooming service sector. Industries compete among themselves for manpower especially in operative levels. However, the young people are looking for better working conditions and higher social status which are very often

the advantages of service industries over manufacturing. The abundant supply of cheap labour has been the major contributing factor for the success of clothing industry but now no longer prevail. The competitive edge secured on the basis of low-cost labour is lost. The constrained supply of new labourer and problem of continuous aging and shrinking of existing labour force further limit the factories to maintain their productivity without additional investment in machineries ,implementation of advanced manufacturing processes and importation of Chinese labours.

Increase competition from other low-cost countries

International competition is intensified by the emergence of other lower-cost countries in the ASEAN region, China and South America. These countries progress aggressively and offer lower-cost garments with competent quality acceptable to the market-place. The quality advantage of Hong Kong's manufacturers over other low-cost competitors are diminishing. Increase in market segmentation and product range accelerate international and domestic competition but further limit manufacturer's ability and flexibility to satisfy every-changing customers needs.

Pressure From Buyer

The traditional development of Hong Kong clothing industry are "Original Equipment Manufacturing" emphasizing heavily on the tight control of manufacturing costs and delivery but not aware the marketing function and development of its own brands and product. Majority of the clothing manufacturers produce to specifications and designs provided by overseas customers. It has been a long development of buyer market in this industry. The clothing retailers and manufacturers in the United States and Western Europe have strong bargaining power over the domestic clothing manufacturers on negotiating prices and terms of doing business.

Recently the overseas customers have increasingly demanded fashionable clothing in shorter cycle times. Overseas domestic clothing manufacturers next to these markets have already developed Quick Response System to provide real value services and garments to the final consumers. The geographic location of Hong Kong far away from major markets further deteriorate Hong Kong's competitiveness in Quick Response Manufacturing.

The recent merger of department stores and retailers increase pressure on Hong Kong clothing manufacturers. For example, in the United States , the merger of big retailers

of Federated , R.H.Macy and Lazarus during end·1994 and early 1995 dominates majority of the retail stores in New York down town.[3] Such strong centralized buying power has the ability to scan the world for the best product and price, increase buyer's bargaining power and pressurize Hong Kong clothing suppliers on lower price, higher quality, quicker delivery.

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[3]Inside Fashion vol 5 Issue 4 , February 16-28,1995

CHAPTER II

QUALITY IMPROVEMENT AS A STRATEGY TO KEEP COMPETITIVENESS

In view of the difficulties faced by Hong Kong garment industry, production process must be improved so as to adapt the constant changing market conditions. They must be re-designed not only to improve output, performance, quality, and services to fulfil the customers' needs and expectations; but as also to minimise production costs to maintain the comparative advantages and to stay ahead of other competitors. To begin with, we look at the internal quality improvements.

Total Quality Management (TQM)

Many writers and magazines have reported that substantial amount of money (billions of dollars) are being wasted annually due to lack of focus on quality improvement. This waste ranges from trivial matter of improper schedule meeting to that of defective products and inferior services, resulting in the loss of customers and markets. Moreover, it makes the production process less flexible and cannot response to the market changes in time.

The monetary effect of correcting the lack of focus on quality is estimated to be at least 15% of the cost of any product or service.[4] It has a significant impact on the competitiveness of the company.

There are different views on the definition of "Quality": traditional concept views quality as conformance to a predetermined set of specification and relates to long lasting products; whereas modern strategic concept emphasises on fulfilling the customers' needs and expectations. Throughout this chapter, we base our discussion on the strategic view as it is vital to the restructuring of the manufacturing process facing by the garment industry. R Tenor and J Detoro have defined quality in their book "Total Quality Management" as: a basic business strategy that provides goods and services that completely satisfy both internal and external customers by meeting their explicit and implicit expectations. Furthermore, this strategy utilises the talents of all employees, to the benefit of the organisation in particular and society in general, and provides a positive financial return to the shareholders.[5]

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[4]D Hoffherr, W Moran G Nadler - Breakthrough Thinking in TQM p3.
[5]R Tenner & J Detoro - Total Quality Management p31.

However, quality is neither determined by workers in the factory nor staff from the marketing or customer service departments. Instead, the senior managers should determine the quality as they are the one who sets up their vision and goal for the ultimate success or failure of the company. They are also responsible to customers, employees, suppliers and shareholders. They have to allocate resources, decide which market segments for their products, and implement the management and production system to achieve their goal. TQM is a philosophy that helps senior managers to apply quality standards through quality management concepts and tools to an organisation in order to make it more efficient, flexible, customer focused, and friendly.

Our approach is based on three main areas - customer focus; continuous process improvement; and total commitment by all level staff.

Customer Focus

Identifying Your External Customers

It is important to identify who are your external customers because you have to constantly fulfil their needs and expectations in order to have comparative advantages over your competitors. As a result, your customers will

see you as an added value and as part of their organisations. Then, a customer demography is prepared to show the customer types, customer segmentation and stratified markets.

Identifying Your Internal Customers

Identifying external customer already is not an easy task, identifying internal customer is even more difficult. It means to find out your potential customers within the company - your fellow employees whom you will pass your output which may be in the form of physical products or reports that you have produced as part of your work process. Your internal customers will use your output in their work process. If we cannot identify any individual who receives our output, most probably we are wasting our effort to produce scrap. Furthermore, if we cannot satisfy our internal customers for different process, it has a dramatic final effect on the external customers. For example, a company who has only three process always satisfies 95% of the internal customers, the final outcome will be (95%x95%x95%=86%) satisfaction to external customers only.

Listening to the Voice of Customers

What drives customer loyalty? And what makes customers jump ship? A company that waits for negative feedback from customers to filter down through the grapevine has waited too long".[6] To ascertain customers' expectations, we have to ask the right questions in the right way and at the right time. Customer expectations are learned by experience and no company owns its customers and could determines its customer needs.

Our performance level can be measured in three levels. The basic level is the fundamental customer requirements which should be fulfilled whatsoever. Any violation will drive our product out of the industry. The intermediate level includes product specifications that can be discuss and negotiated. The final stage is value added which will give customer great surprise if fulfilled. However, we must not be mislead by vague response, such as "we are quite happy with your products" without any specification (i.e. the characteristic that they like most).

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[6] L E Coleman & D G Reynolds - World Executive Digest Feb 95: The Voice of Customer

Once we have analysed the customers' expectations, we have to translate them into technical product specifications through the assistance of Quality Function Deployment.

Achieve Zero Customer Defections

The longer your company keeps a customer, the higher percentage of profit it makes. When customers leave, they take all these profits with them to your competitors.[7]

Continuous Process Improvement

Instead of diverting resources and effort to remedy each deviation, it is better to improve the quality performance of key processes in order to prevent the crisis. What are the key processes? Those that produce outputs having the greatest impact on customers; that have the highest visibility with customers; and that have the potential for substantial improvement.

Improving Existing Production Process

(a) Define the problem - To accomplish this procedure, we have to identify both the outputs and customers (internal & external) from each key process. Are

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[7]J K Cannie - World Executive Digest July 94: Loyal Customers Are Gold Mines

customers' requirements being fulfilled? Staff also have to be assigned as owners of the processes, responsible for the allocation of resources and authorization of any changes subsequently.

(b) Documentation of the Process - Apart from detail description of the structure and workflow, it is advisable to include charts and diagrams, showing the inefficient and redundant procedures. For example, the statistical process control (SPC) may provide charts that act as a road map to develop quality audits[8].

(C) Analyse the Problem - What causes the inefficiency and is there any shortcut method? Are there any specific factors restricting the full utilization of the capacity?

(d) Develop and Test Alternative Solutions - It should address to the root causes of the problem. For example, bottlenecks in the manufacturing cycle can be resolved by the Just-in-Time manufacturing process. It will reduce the work-in-progress and finished goods inventory.

(e) Benchmarking - It is to find out the best level of performance for the similar operations. It may be

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[8]Apparel Industry Magazine Mar 1991

obtained internally by comparing the similar operations within your company (suitable for multinational companies) or externally from competitors which may be expensive.

(f) Implementation and evaluation - The improvements identified are being implemented and evaluated against the benchmarks to assess the effectiveness of the new process.

Performance Measurement

Without a well designed performance measurement system, the data generated may give wrong directions to the company. Each process has its own characteristic measure. You have to abstract the product characteristics from the customers expectations, then, translate these characteristics into the product measure to see how your performance levels satisfy your customers.

Total Commitment

Senior management has to show their dedicated commitment to the TQM by allocating sufficient resources and funding to the project; giving extensive training to staff; actively participate in the implementation; and delegating responsibility to lower level staff.

However, senior management's commitment alone is not enough. "An organization not only has a head; it also has a heart. And the size of the heart depends upon the size of the employee commitment to its ideals and goals. Organizational vitality from the bottom up must be built"[9]. We have to cultivate an environment that all employees perceive continuous quality improvement is beneficial to the company on long term basis.

Leadership and Empowerment

Managers have to be trained up as TQM leaders who have authority to set direction, allocate resources, set up quality standard, and determine the market segment. They must have their vision in order to determine the goals and objectives of the company. But leadership alone is not sufficient, they should accompanied by empowerment. As R Kanter of Harvard Business School defines "Powerlessness corrupts. Absolute powerlessness corrupts absolutely.[10]" Moreover, leaders at the top level should set the major goals and directions of the company, leaving daily decisions to the middle and bottom level. This will bring leadership alive at all levels.

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[9]B Creech - World Executive Digest July 94 "Winning the Quality War"
[10]B Creech - World Executive Digest July 94 "Winning the Quality War"

Training and Education

Employees should be trained to be a producers and not just a processors. Together with proper motivation, their output will meet the quality requirement. However, the training requires to be an ongoing process. Otherwise, the improvement process will come to an end when the employees have completed their training and return to normal working habits.

CHAPTER III

PERFORMANCE & QUALITY ACHIEVEMENT

To further our study on the relationship of quality management and organization performance, we have conducted a postal survey on some of the garment companies in Hong Kong.

Objective

1. To obtain statistic data that is not available through published reports.
2. To investigate the current technological level and quality awareness of Hong Kong clothing industry.
3. To study how quality and productivity improvement practices relate to actual quality, productivity and financial performances in clothing industry.
4. To compare our study with the findings in the research project of " Quality and Productivity Improvement Practices in Hong Kong Manufacturing Industry" conducted by Mr. Lam Ka-chi and Ms. Wong Suet-yee in May 1994.

Methodology

The following is a brief description of the postal survey.

- The questionnaire was designed to obtain specific information. The analysis of the information are presented in subsequent section of chapter 4.
- The design of the questionnaire is primary based on the questions from Benson, Saraph and Schroeder (1991), with slight modification.1.
- The questionnaires were sent to approximately 277 clothing companies. Follow-up telephone call was made to 80 companies out of above 277 companies to confirm their receipt of the questionnaire.
- Same questionnaires were sent to 60 evening-course students in the Post Experience Certificate Apparel Merchandising class of the Hong Kong Polytechnic University.

Footnote:

1. Everett E. Adam,Jr.," Alternative Quality Improvement Practices and Organization," Journal of Operations Management 12(1994) 27-44.

The following table describes the mix of the companies selected and their responses.

Fig. 10. Respondents to Postal Survey

Company	Number of Questionnaire sent	Number of Response
Factory with production plant in Hong Kong	158	7
Factory with offshore production	82	12
Buying office	7	1
Polytechnic students	60	34
	337	54

A return rate of 15% ie recorded. The following summary is stated with regard to these 54 responses.

Company Demographics

The following table summarizes the demographic information of the respondents.

Fig. 11

ITEMS	MINIMUM	AVERAGE	MAXIMUM
No. of Employees	2	109.31	1000
Employee turnover rate (%)	0	20.1	100
Value of Sales ($HK million)	2.34	156.12	1170
Age of Business (years)	1	12.51	140
Employees involved in quality improvements (%)	1.5	20.74	100

Company Size

Among the 54 respondent, the size (in term of number of employees) do vary. The smallest company is a one-man show whilst the largest one has around 1,000 employees. On average the size is around 109. This sample could be classified as a typical small to medium size garment firm.

Turnover Rate

50 respondents response to this question. Among which the average turnover rate is 20.19%. The lowest turnover rate is zero while the highest is 100% which is contribute by a firm of 2 employees.

Company Sales

Only 38 companies responded to this question. The lowest respond rate among all the demographic questions. The sales vary significantly from 2.3 million to 1.1 billion with an average of 156 million.

Year in Business

The question with the highest respond rate. All of the 54 respondent responded to this question. 20.7 years in business is the average for all the respondents. However, the 'oldest' company is 140 year old and 6 of the

respondents have just started their business within 1 year.

Employee involved in Quality Improvement Activities

52 respondents responded to this question. The maximum percentage of employees involved in these activities is 100% while the minimum is 1.5% Over 30 companies have less than 10% involve rate.

Overseas Establishment

Among these 54 companies, 53 have responded to this question. 43 of the respondents have branches or subsidiaries located in other countries. Most than one third of them have branches in more than one countries.

The following table shows a summary of the geographical spread of all these branches:

Fig.12

Place	No. of branches
China	29
Singapore	7
Indonesia	5
India	4
Taiwan	4
Thailand	4
USA	4
Europe	4
Korea	3
Macau	3
Philippines	3
Srilanka	3
Malaysia	2
Japan	2
Australia	2

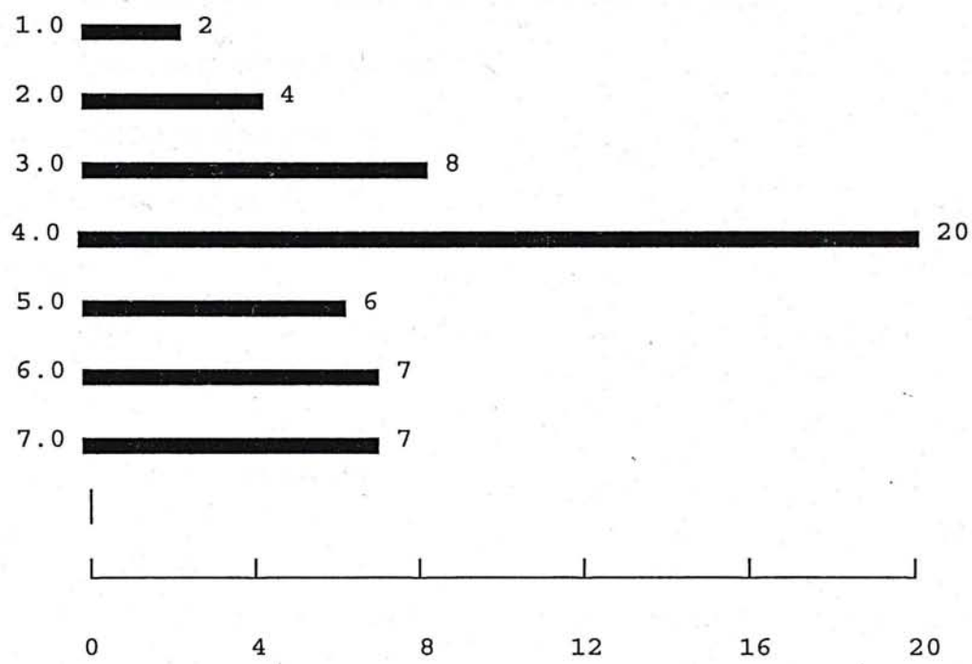
More than 54% of the respondents have branches in China. In fact most of them are manufacturing plants. This reflects the current trends that more and more garment plants moved their manufacturing base to China for cheaper labour and land cost.

Singapore is the second favourite for overseas branches. This may be explained by the similar culture and Chinese background of Singapore. However, this second position falls behind significantly from the first favourite and Singapore is not exceptionally different from the subsequent popular sites.

Other Company Information

Three more questions 1.9, 1.10 and 1.11 have been given to the respondents to ask for their attitude towards quality control management.

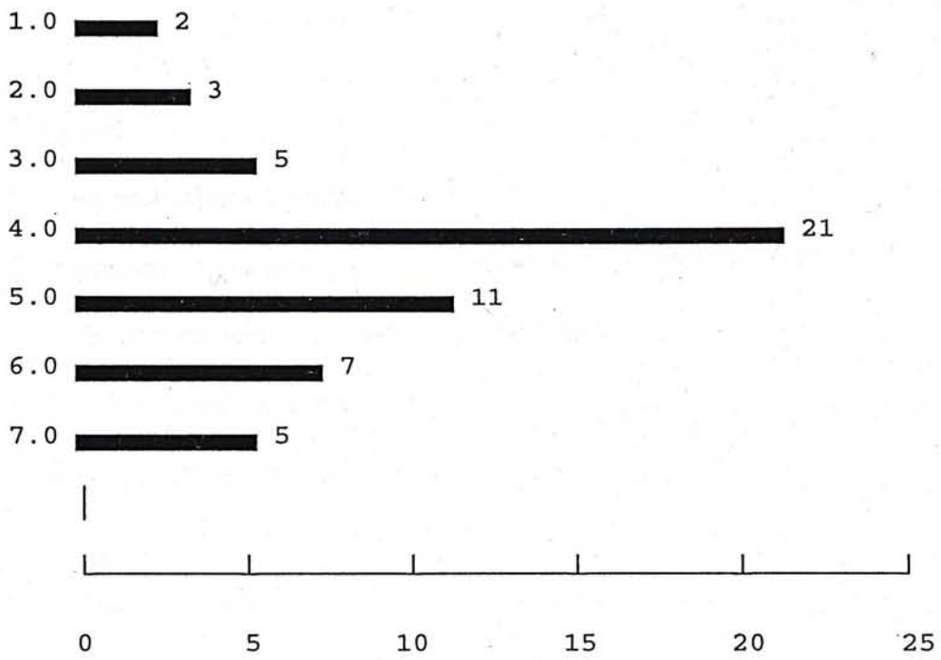
Fig 13. Q_FAMIL 1.9 Familiar with various quality program



Valid cases 54 Missing cases 0

About 40% of the respondent answered take a neutral stand whilst the 35% answered as 'Agree to Strongly Agree'. In other words, the quality management awareness is quite high in the garment industry.

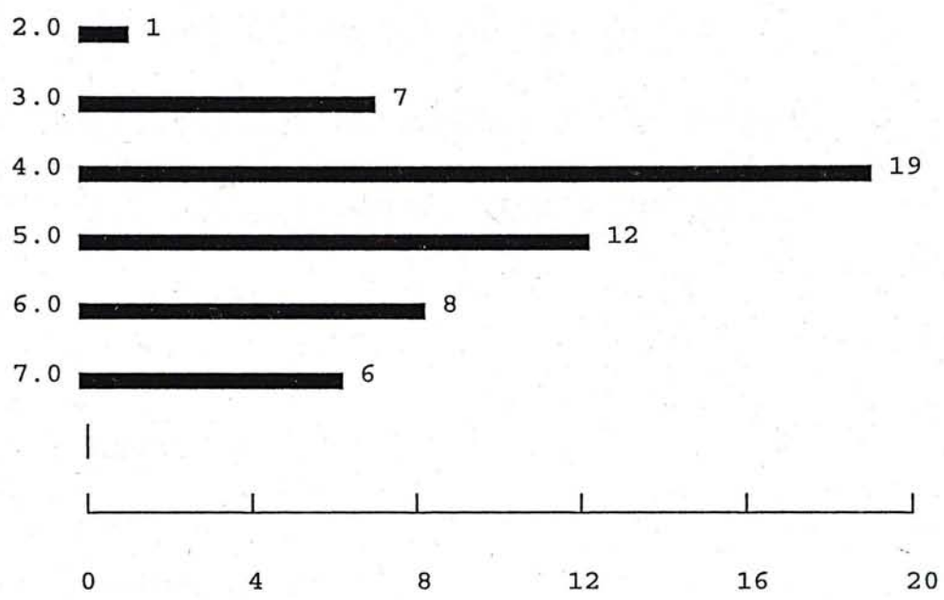
Fig 14 Q_SELF 1.10 Self Improvement in Quality Management Knowledge



Valid cases 54 Missing cases 0

Around 50% of the respondents answered 'Agree to Strongly Agree' which match the findings from the last question ie, those who aware for the importance of quality management will also looking for means to enrich their knowledge in this area.

Fig 15 Q_KNOW 1.11 Knowledge of quality area is comparable to the other managers



Valid cases 53 Missing cases 1

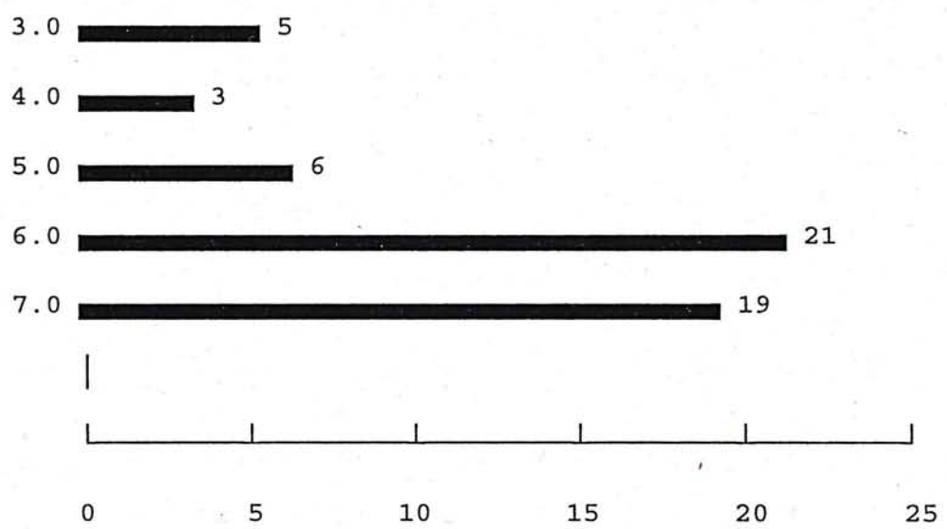
The finding of this question is quite similar to the last 2. 28% of the respondents don't take any stand whilst 50% chose 'Agree to Strongly Agree'.

Company Performance

In this part, customers perception towards the respondents' company performance (question 2.1 to 2.13) is stated in three different aspects: customer perception, quality performance and financial performance.

Customer Perception of Company Performance

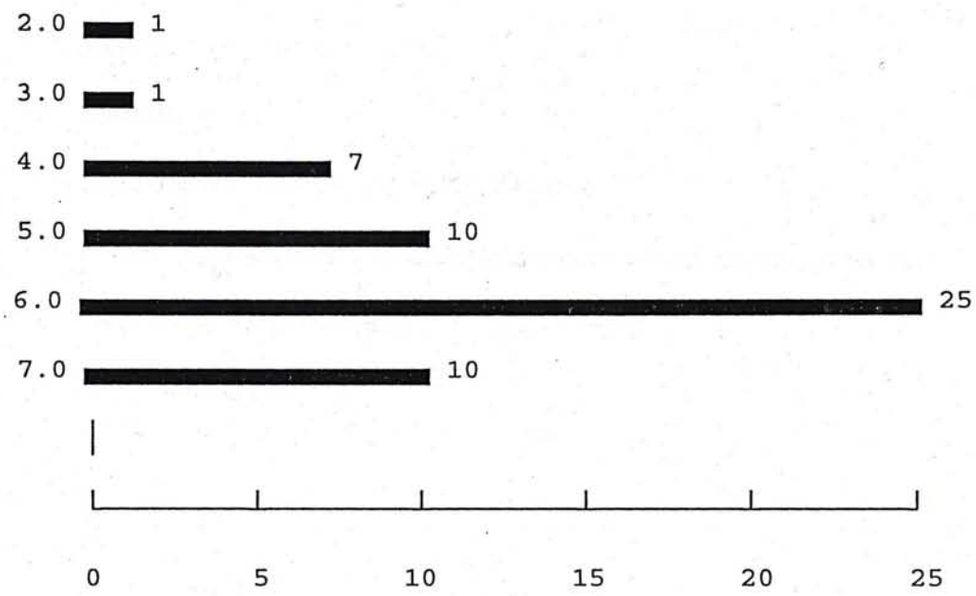
Fig 16 DEMANDQ 2.1 Our customer demand quality



Valid cases 54 Missing cases 0

Over 85% of the respondents answered " Agree to Strongly Agree". So most of them aware that quality is a major factor of customer salification.

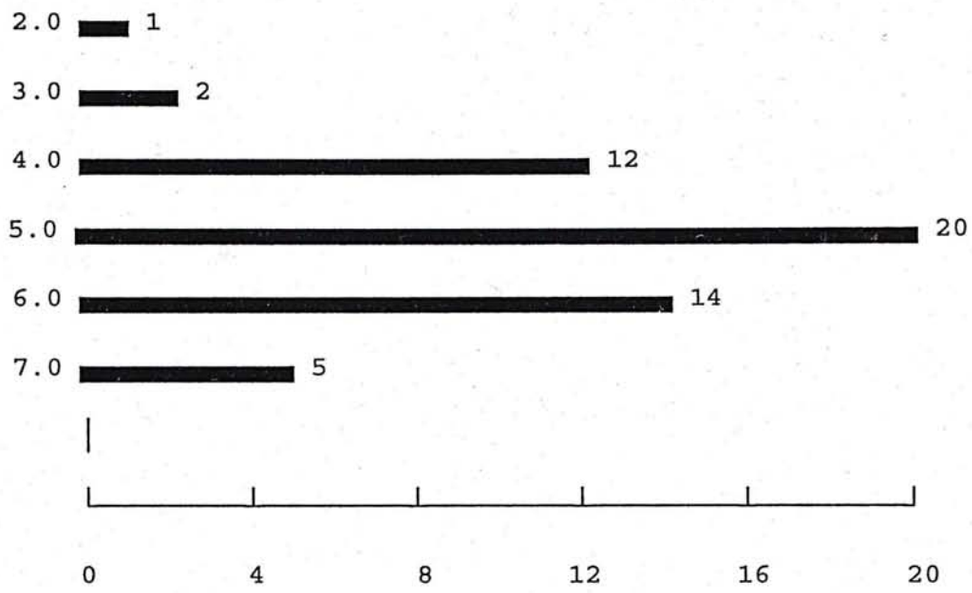
Fig 17 RECVQ 2.2 Our customer receive the quality they expect



Valid cases 54 Missing cases 0

Around 86% of the respondents answered "Agree to Strongly Agree'. In other words most respondents felt that their customer are receiving good quality product from their company. A survival bias may be one of the reasons.

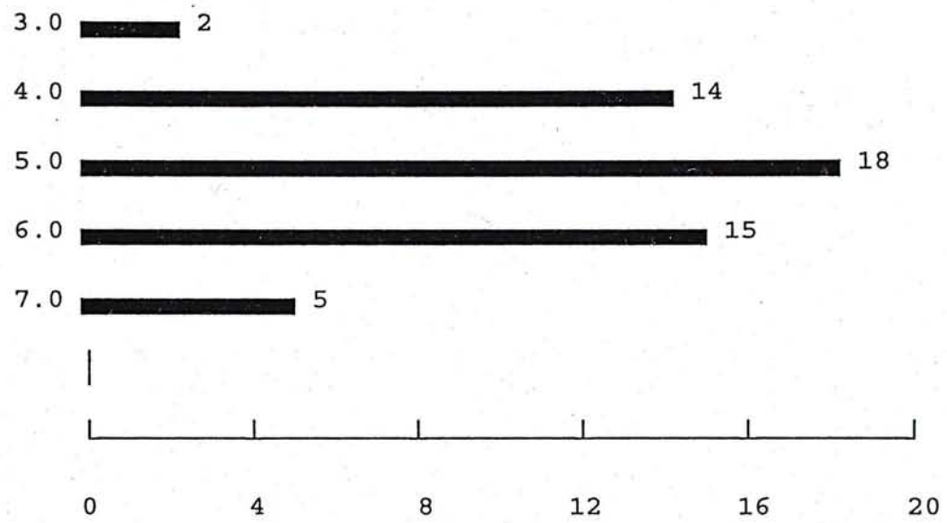
Fig 18 PASTQ 2.3 Customer perceive the company's past year quality performance as



Valid cases 54 Missing cases 0

No respondent thinks that it is poor. More than 72% of the respondents thinks that they are offering "Above average to Good"quality. However, most respondents think that they are only slightly above average.

Fig 19 PASTOPER 2.4 Our customer receive quality performance over the past year



Valid cases 54 Missing cases 0

This question affirm the finding from the last question, over 70% of the respondent think that their quality performance from their customer's view is above average. However most of them thinks that it's only slightly above average. Only 5 of them chose "Good".

Quality Performance

The following table summarizes the findings regarding to the quality performance of the respondents.

Fig. 20

Number of Valid Observations (Listwise) = 40.00

Variable	Mean	Std Dev	Minimum	Maximum	N
% of defective items	8.41	13.78	.1	80.0	48
Waste/Scrap cost	6.24	7.59	.0	30.0	46
Return cost	6.60	10.55	.0	50.0	46
Rework cost	5.76	7.74	.0	35.0	42
Training cost	4.98	8.15	.0	30.0	43

Percent of items defective

Only 48 companies responded to this question. The maximum is 80% whilst the minimum is 0.1%. Generally speaking, over 70% of the respondent maintain a defective rate below 5%. So most of them maintain a good quality performance.

Internal waste/scrap costs

Only 46 companies responded to this questions. The

highest cost as a percent of a dollar sales is 30 while the lowest is zero. Over 65% of the respondents have less than 5% waste/scrap costs. The average cost is 6.24%.

Returns and warranty/adjustment costs

46 companies have answered this question. The highest cost as a percentage of dollar sales is 50% whilst the lowest is zero. Over 40% of the companies have less than 1% return and warranty cost. The average cost is 6.6%.

Rework costs

Only 42 companies answered this question. The highest cost as a percentage of dollar sales is 35% whilst the lowest is zero. However, over 45% of the companies have more than 6% rework costs. One possible reason may be due to the tailor-made nature of garment product. The average cost is 5.76%

Training and development cost

Only 43 companies answered this question. The highest cost as a percentage of dollar sales is 30% while the lowest is zero. Around 8% of the respondent spent more than 10%. The average is 4.98%.

Financial Performance

The following tables summarizes the financial performance of the respondents' company. Due to the sensitive nature of these figures, a relatively lower respond rate is observed.

Fig. 21

Number of Valid Observations (Listwise) = 40.00

Variable	Mean	Std Dev	Minimum	Maximum	N
Net profit last year	10.61	12.49	-10.0	70.0	36
Return on Assets (ROA)	15.03	17.28	.0	76.9	28
Average ROA of past 3 yrs	16.14	22.98	-.5	87.0	25
Sales growth past 3 yrs	1.75	57.07	-300.0	100.0	36

Last year's net profit

Only 36 companies answered this question. The best performer recorded a 70% per dollars sales whilst the worst performer recorded a lost of 10% per dollar sales. An average of 10.61% is recorded for all the respondents. Very much close to the annual inflation rate which indicates that the garment industry is relatively in a low growth stage.

Return on asset for Last year

Only 28 companies answered this question. The best performer recorded a 76.9% whilst the worst performer recorded zero percent. An average of 16.3% is recorded for all the respondents. Around 50% of the companies have a value of 5% ROA or less. This indicates that the industry do not offer a very good yielding.

Average return on asset for the Last 3 years

Only 25 companies answered this question. The best performer recorded a 87% whilst the worst performer recorded a lost of 0.5%. An average of 16.14% is recorded for all the respondents. Comparing the result of this question with the last one indicates that the industry is actually declining in the last 3 years.

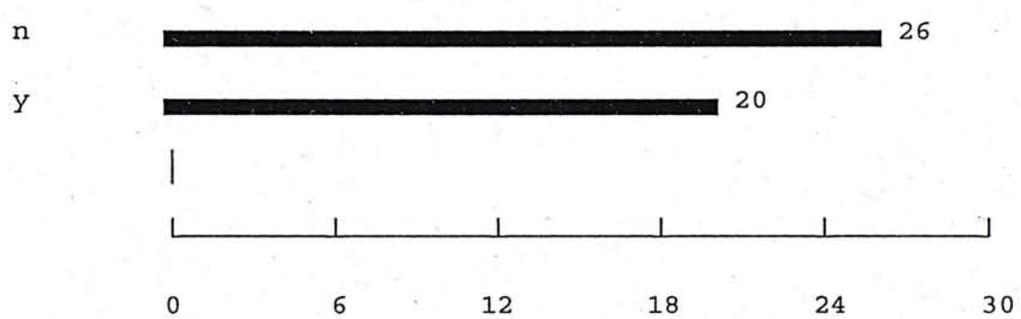
Past 3 years's sales growth (decline)

Only 36 companies answered this question. The best performer recorded a 100% growth whilst the worst performer recorded a decline of 300% An average of 1.7% is recorded for all the respondents. This result further indicates the trendy nature of the business (from -300 to + 100 growth), moreover an average growth of 1.7% further confirm that the industry is actually declining in the last 3 years.

Quality Improvement Techniques

In this part, the technique adopted by the companies in quality improvement is stated.

Fig 22 FORMQ 3.1 Our Company has a formal approach to quality improvement

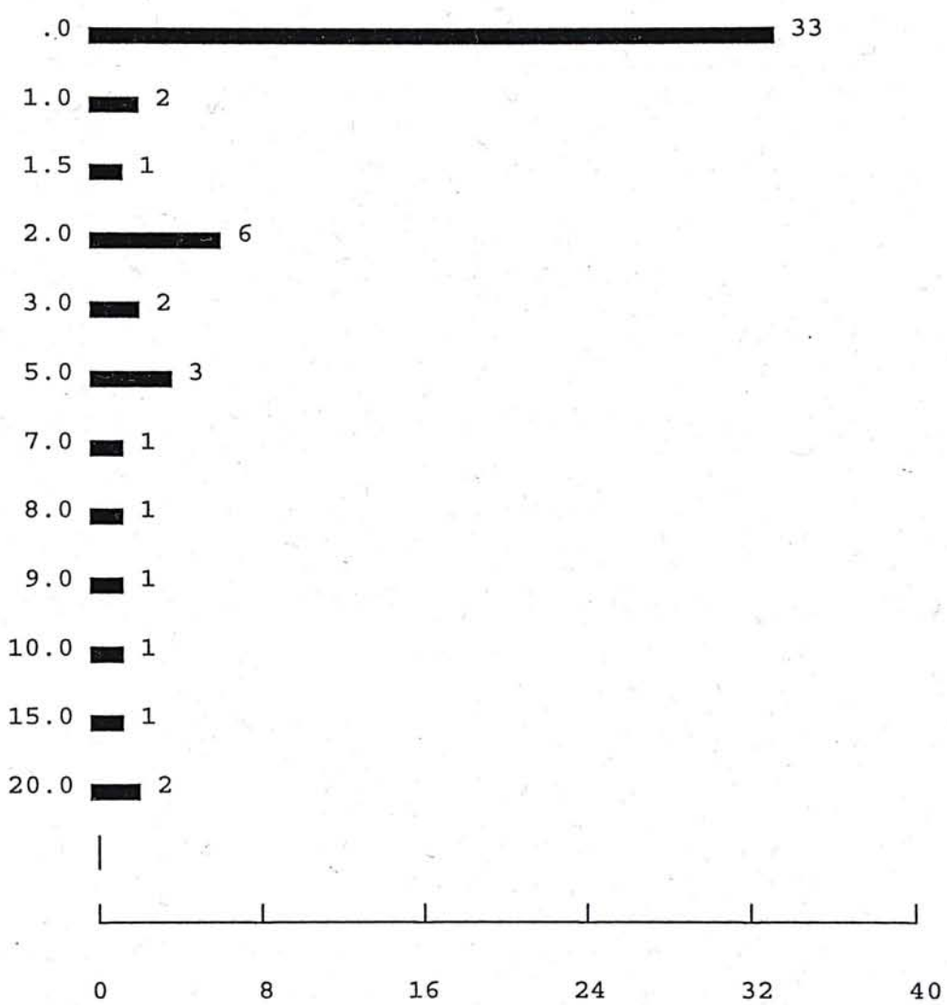


Valid cases 46 Missing cases 8

This question only 20 out of the 46 valid cases have formal approach to quality improvement. That is less than 50% of the valid respondent which we think is a very typical situation in Hong Kong and we confirm this during our interview with 2 chosen companies.

Fig 23 YRFORMQ 3.2 Number of years adopting the formal approach

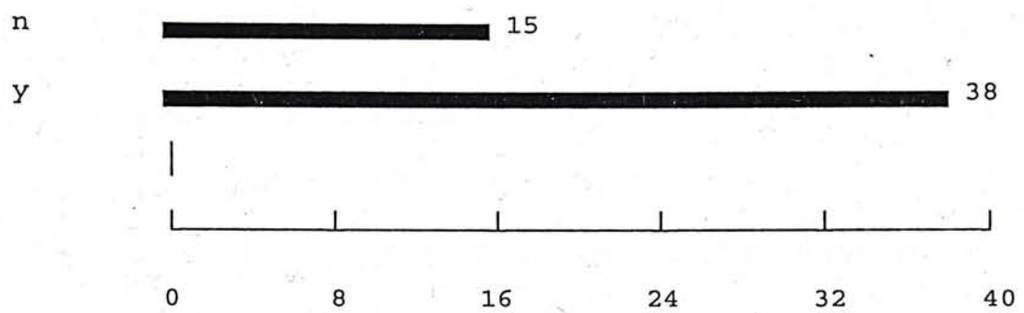
of quality improvement



Valid cases 54 Missing cases 0

Among the 21 respondents who adopt a formal approach, only 4 of them have adopted for more than 10 years. Nearly all of them have adopted the approach for 2 or more years.

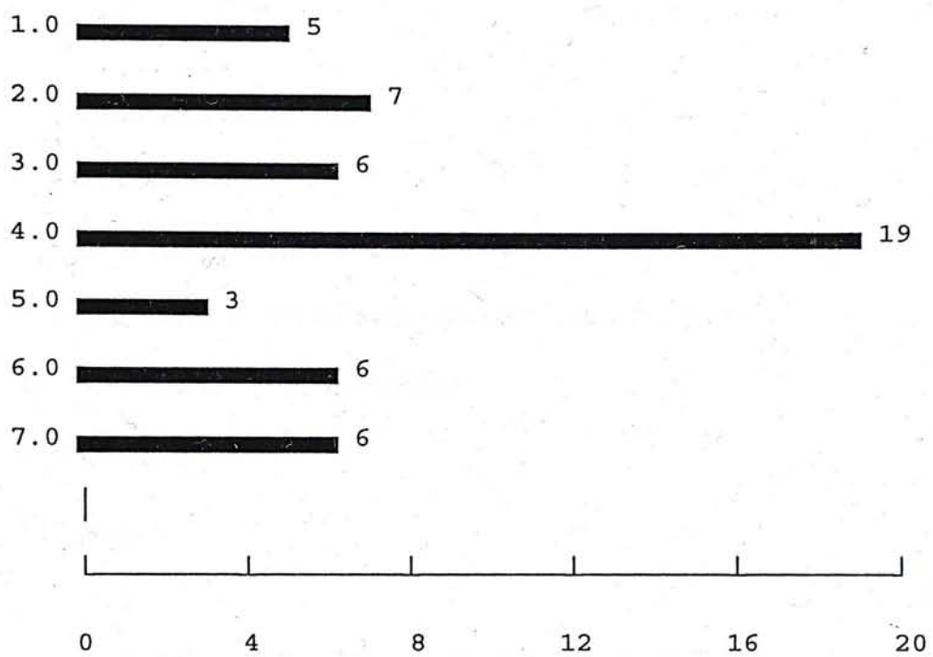
Fig 24 SEPO 3.3 Separate quality department



Valid cases 53 Missing cases 1

38 companies have separate quality department. Among these over 45% have less that 10 staff. The largest company have a quality department of 120 staff.

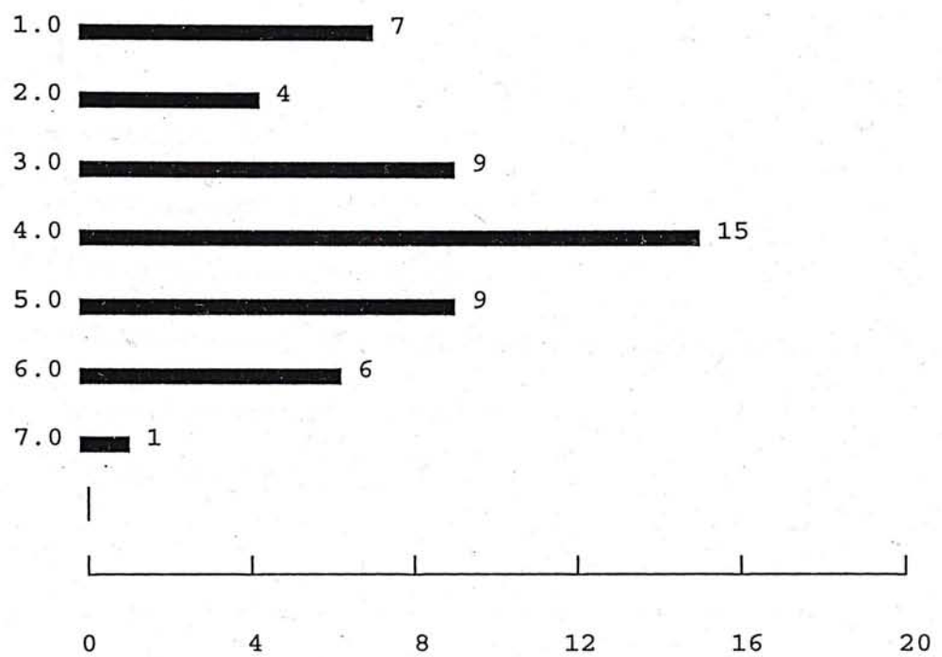
Fig 25 STAFFQ 3.5 Our company's quality improvement is best describe as apply no formal approach



Valid cases 52 Missing cases 2

Around 32% of the respondent answered "Agree to Strongly Agree" on there is no formal approach being adopted by their companies. However, the other 34% answered disagree to this statement while the other 34% remain neutral a very mix situation.

Fig 26 SPC 3.6 Our company applies statistical process control

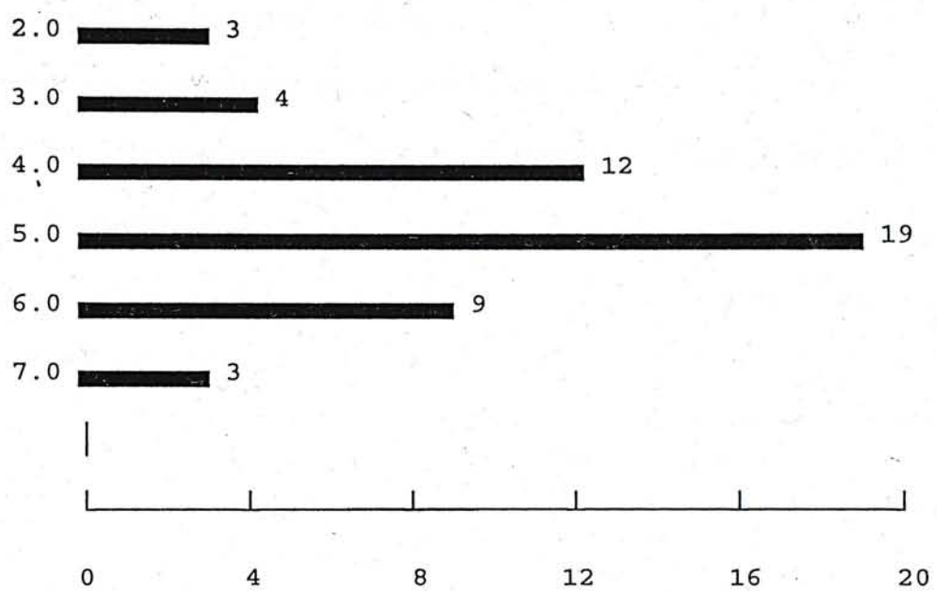


Valid cases 51 Missing cases 3

Around 39% of the respondent indicated that their companies have not apply SPC while another 32% indicated they do. The remaining are neutral.

Fig 27 RESP 3.7 Quality improvement is best described as each

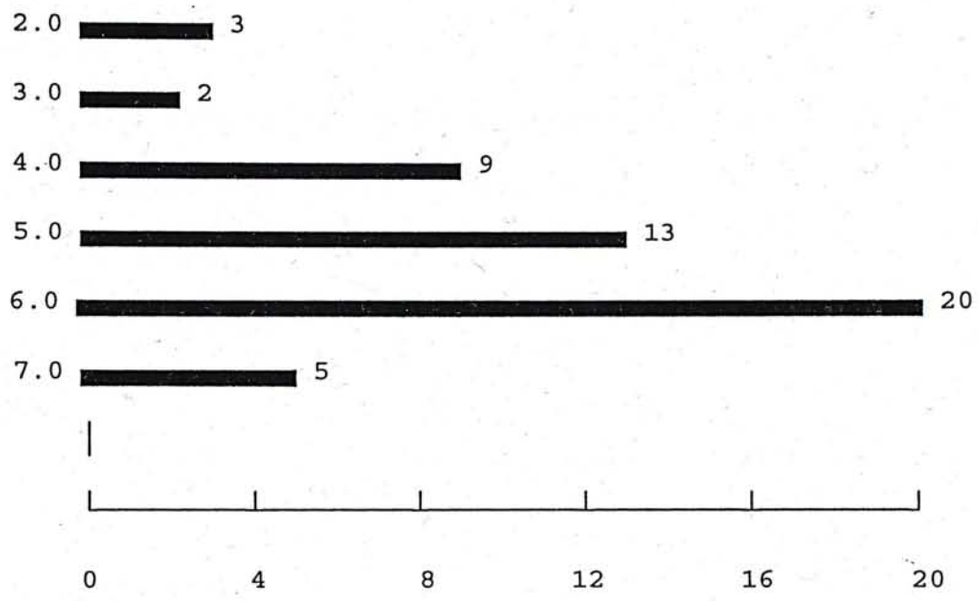
Employee Responsibility



Valid cases 50 Missing cases 4

Non of the respondent totally disagreed. Only 14% tends to slightly disagree while 62% of the companies answered "Agree to Strongly Agree".

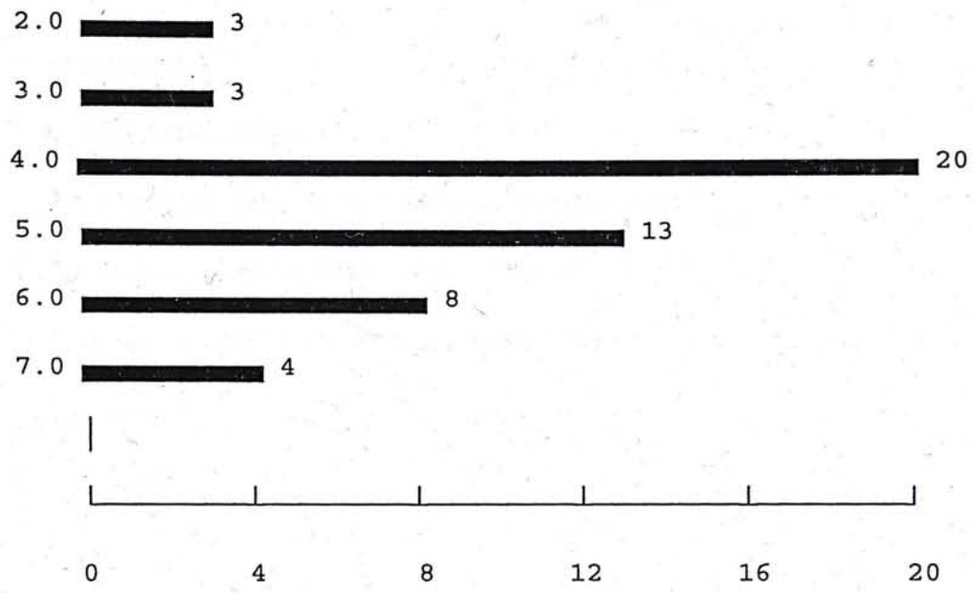
Fig 28 MGMT 3.8 Quality improvement is best described as management involvement and responsibilities



Valid cases 52 Missing cases 2

More than 78% of the respondents answered "Agree to Strongly Agree" much stronger than the percentage in the last question 3.7. This may be due to the conventional thinking of "Quality is the Boss's business".

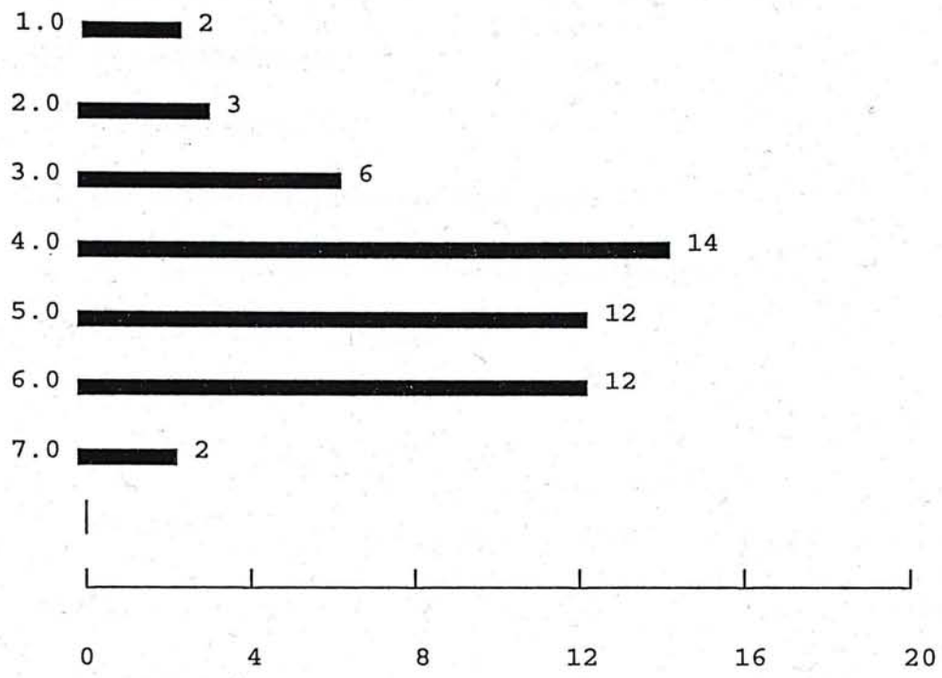
Fig 29 SOLVE 3.9 Quality improvement describe as identifying and resolving improvement project.



Valid cases 51 Missing cases 3

Non of the respondent totally disagree, only less than 6% slightly disagree on the statement. More than 50% of them answered "Agree to Strongly Agree". This may indicate that most of the companies adopt a case by case approach.

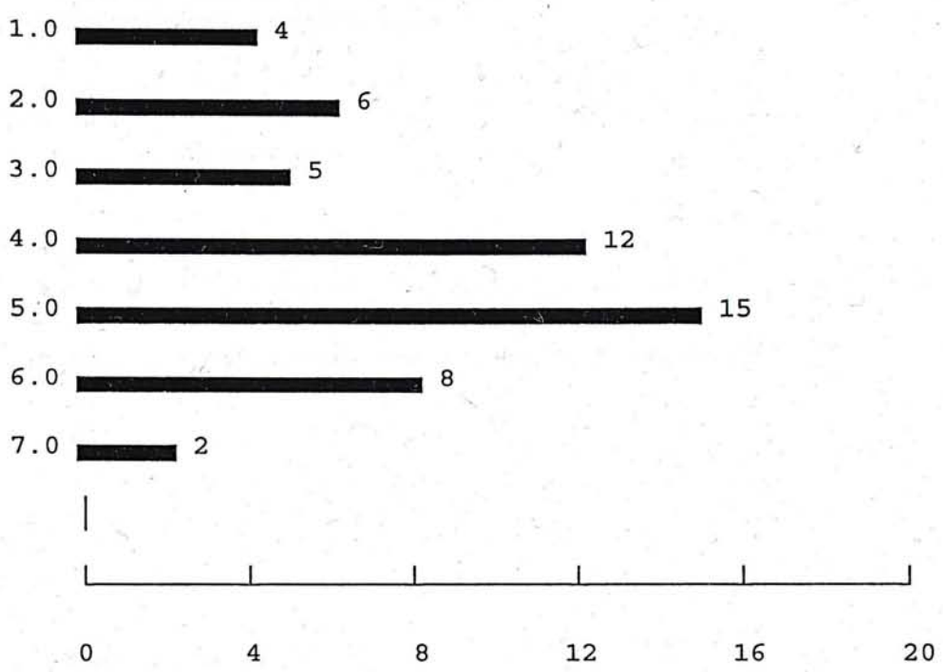
Fig 30 CRISIS 3.10 Quality improvement on a Crisis basis



Valid cases 51 Missing cases 3

Over 50% of the companies answered "Agree to Strongly Agree". Only 22% answered "Disagree to Strongly Disagree". A quite typical situation in most of the Hong Kong companies.

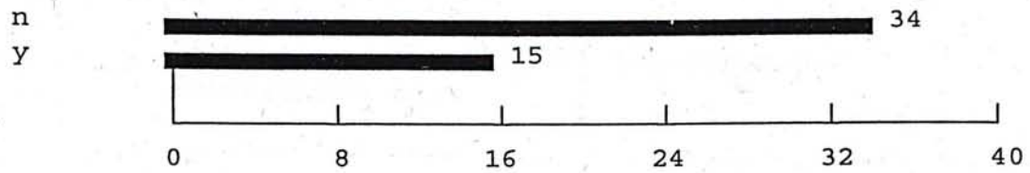
Fig 31 REWARD 3.11 Quality improvement by reward focus



Valid cases 52 Missing cases 2

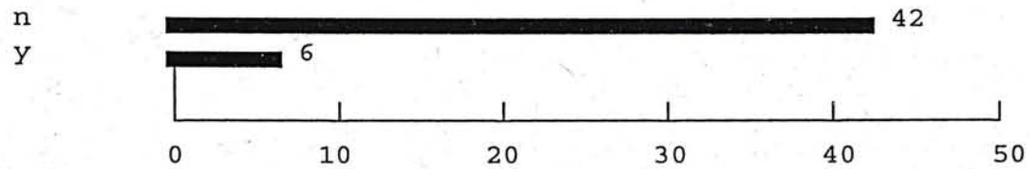
About 50% of the companies agree to strongly agree to this approach. Around 30% disagree to this approach.

Fig 32 QCIRCLES 3.12 Applying quality control circles



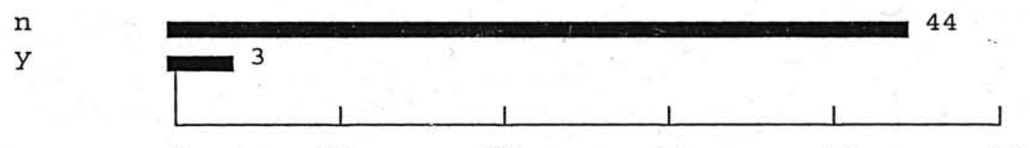
Valid cases 49 Missing cases 5

Fig 33 Q7TOOLS 3.13 Applying Quality control 7 Tools



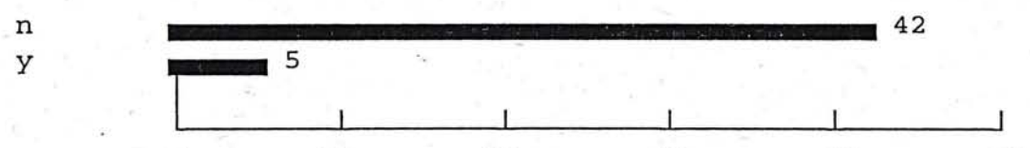
Valid cases 48 Missing cases 6

Fig 34 TAUCHI 3.14 Applying Taguchi method



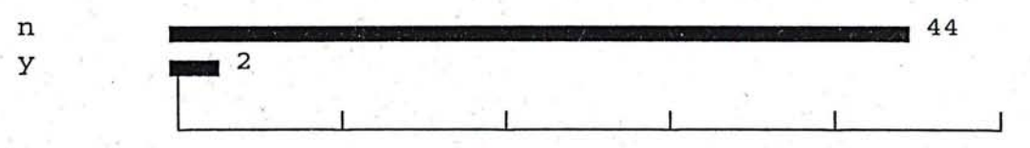
Valid cases 47 Missing cases 7

Fig 35 Q5S 3.15 Applying 5S



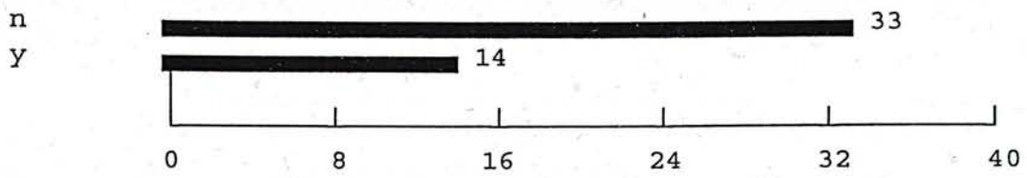
Valid cases 47 Missing cases 7

Fig 36 FOOLPROF 3.16 Applying Fool Proof



Valid cases 46 Missing cases 8

Fig 37 QFCT 3.17 Applying quality function deployment



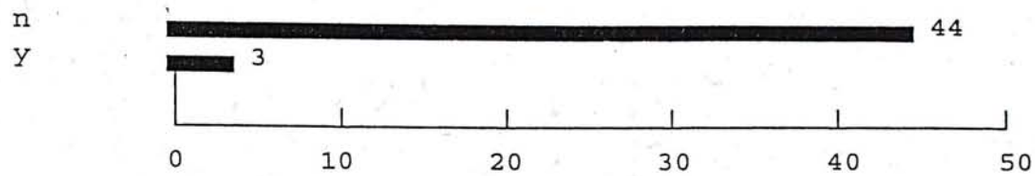
Valid cases 47 Missing cases 7

Questions 3-12 to 3-17 are stated to see whether the respondents have applied the six quality improvements techniques, namely Quality Control Circles, Quality Control 7 Tools, Taguchi Method, %s, Fool-proof and Quality Function Deployment (QFD). From these figures, we can see that more than 80% of the respondents are NOT familiar to these techniques.

However, Quality Control Circle and QFD are the most popular relatively to the rest.

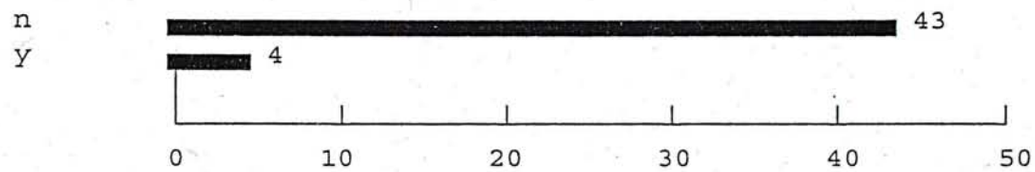
Giving their technical training background, to our surprise, the response from the polytechnic student are extremely low as well. It may also indicate that all these tools are not very popular in the Hong Kong.

Fig 38 EDWARDD 3.18 Familiar with Edward Deming



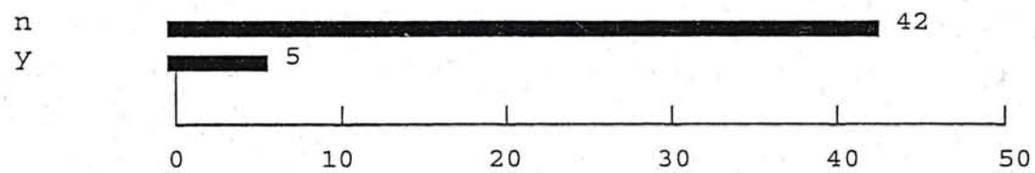
Valid cases 47 Missing cases 7

Fig 39 JOSEPHJ 3.19 Familiar with Joseph Juran



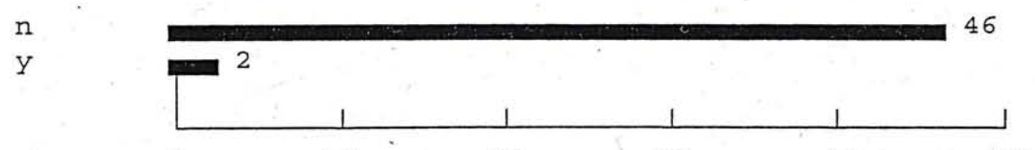
Valid cases 47 Missing cases 7

Fig 40 PHILIPC 3.20 Familiar with Philip Crosby



Valid cases 47 Missing cases 7

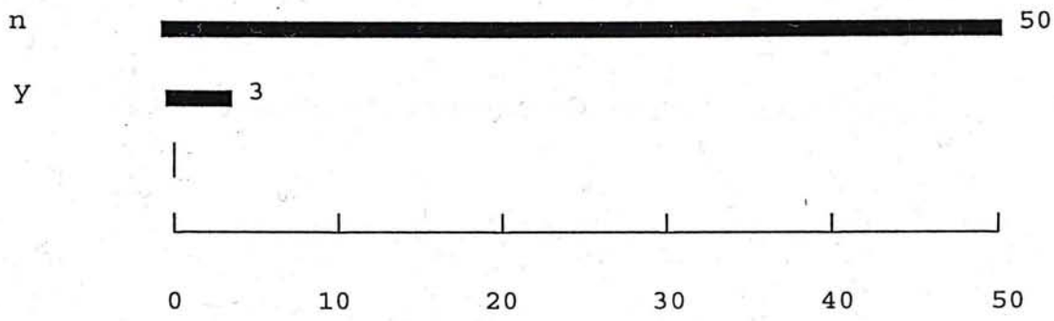
Fig 41 KAORUISH 3.21 Familiar with Kaoru Ishikawa



Valid cases 48 Missing cases 6

Question 3-18 to question 3-21 are stated to show whether the respondents are familiar with the four gurus in quality management, namely Edward Deming, Joseph Juran, Philip Crosby and Kaory Ishikawa. It shows that most of the respondents are not familiar with these gurus.

Fig 42 CERT9000 3.22 Is the company certified as a ISO 9000 producer



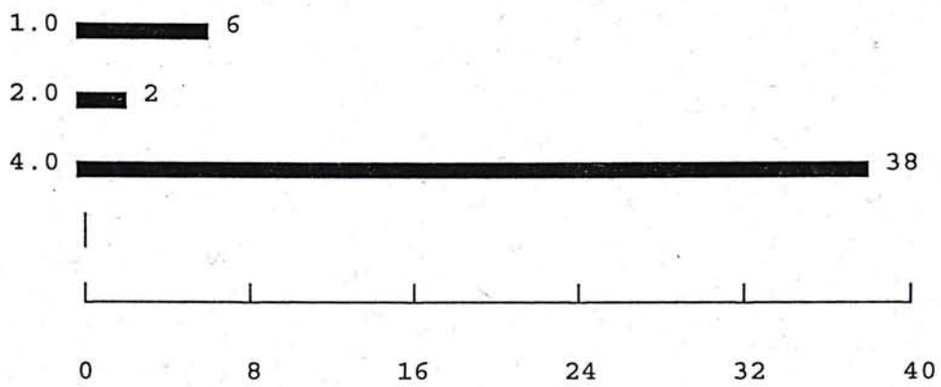
Valid cases 53 Missing cases 1

Only 3 of the respondents have been certified as a ISO 9000 producer. All of them have been certified as ISO 9002.

95% of the respondents have not been certified.

However, it is quite unpopular in the garment industry to be certified in Hong Kong.

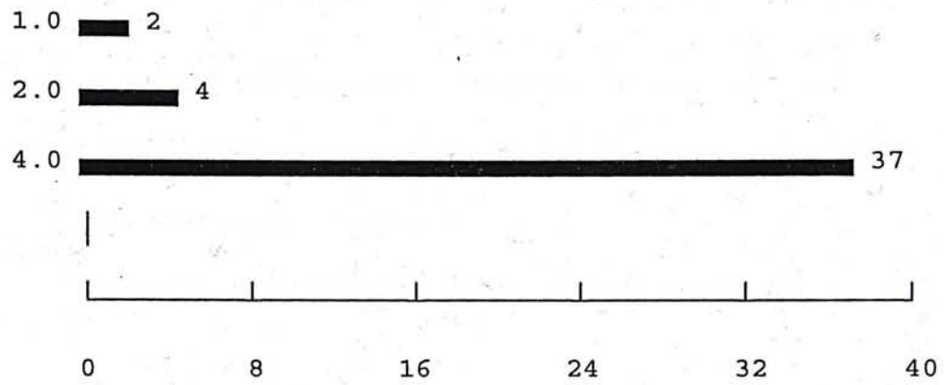
Fig 43 ISOSTD 3.24 Interest in applying ISO 9000



Valid cases 46 Missing cases 8

38 of the respondents indicated that they are not interested in the ISO 9000. ie around 86% of the responded companies. 6 companies are interested in ISO 9001. 2 companies interested in ISO 9002 while none of them is interested in ISO 9003.

Fig 44 YR9000 3.25 When does the company apply for ISO 9000 ?

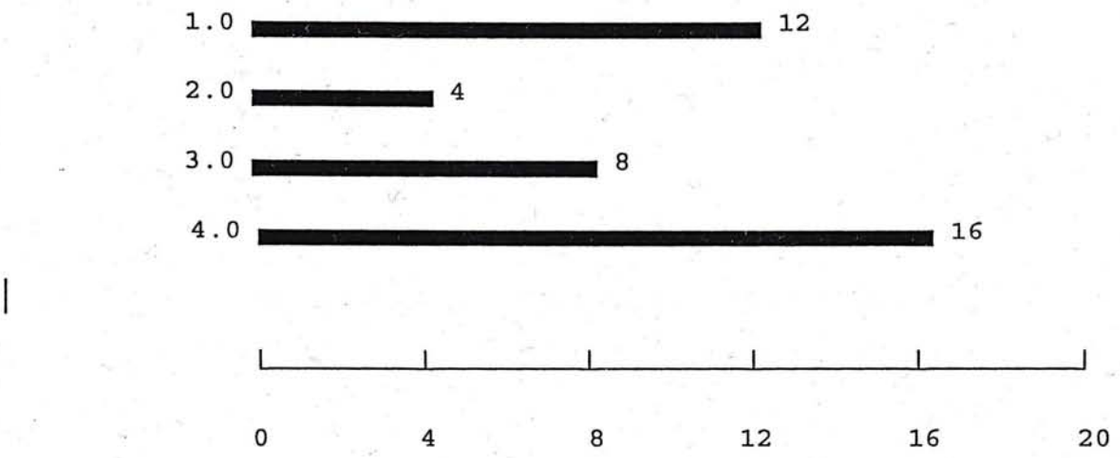


Valid cases 43 Missing cases 11

37 respondents indicated that their companies have not yet decided when would they apply for ISO 9000. 2 of them indicated they would apply within the year while another 4 would apply in the coming 3 years. non of them chosen the "others'.

This finding confirm that the interest of ISO 9000 in the textile industry in Hong Kong is not very popular.

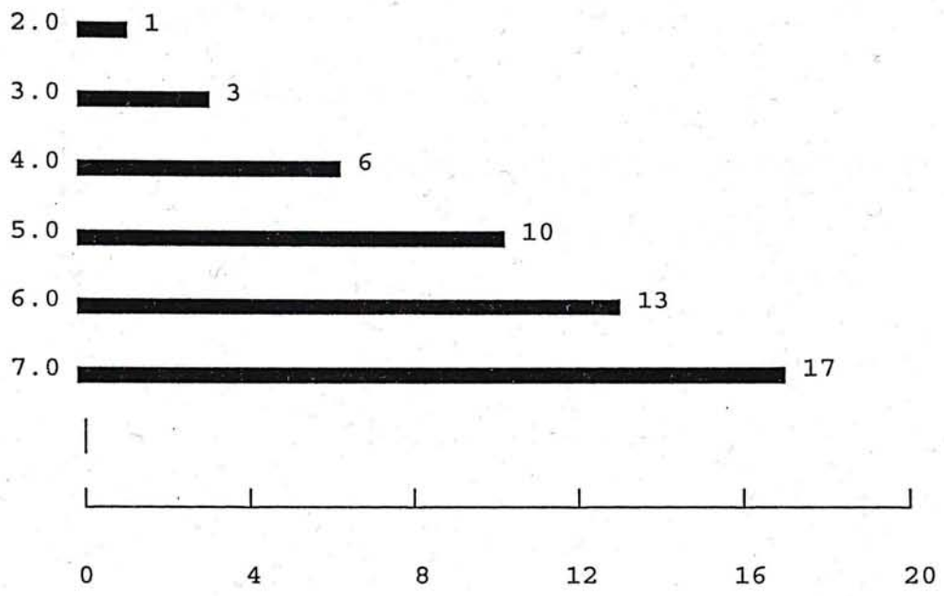
Fig 45 STFF9000 3.26 Use own staff or external consultant to apply for ISO 9000?



Valid cases 40 Missing cases 14

40 companies responded to this question even though not many of them have indicated interest in ISO 9000. However, 16 of them have not yet decided on whether internal staff or external consultant will be used. 12 companies or 30% of the respondents have preference to use their own staff while 10% will like to use external consultant only.

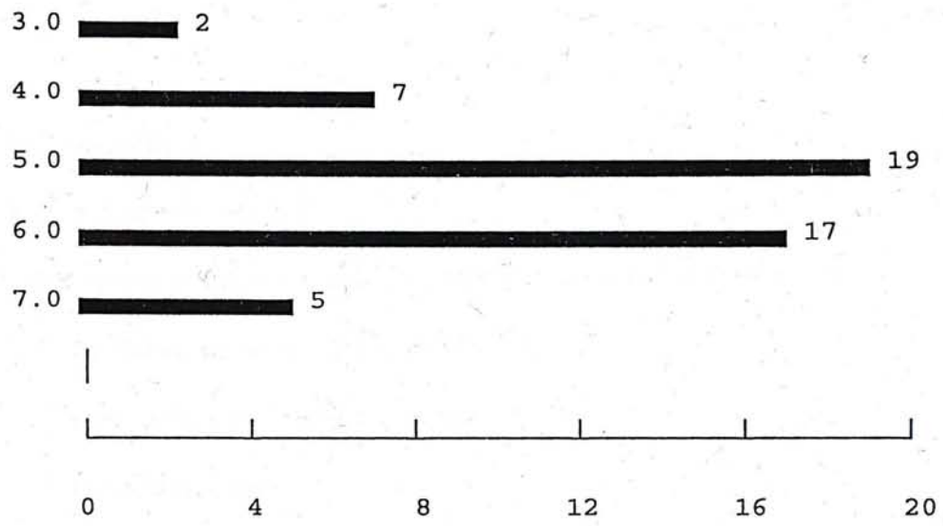
Fig 46 CUST 3.27 Customers' view are actively sought



Valid cases 50 Missing cases 4

80% of the respondents adopted this approach as a mean to understand the customers' requirement and produces according to it. None of them disagreed.

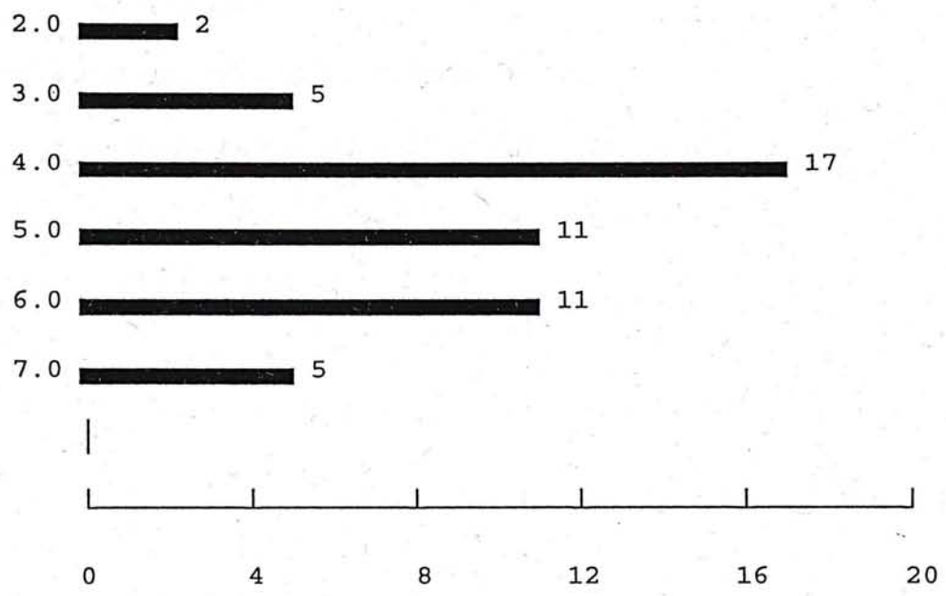
Fig 47 INSPECT 3.28 Inspectors' assurance of conformance



Valid cases 50 Missing cases 4

82% of the respondents agree that their companies have a number of inspectors to assure that their product conform to the specification. Only 4% don't. This match with the general view that the textile industry are more labour intensive and manual inspection are essential in ensuring conformance to the specification.

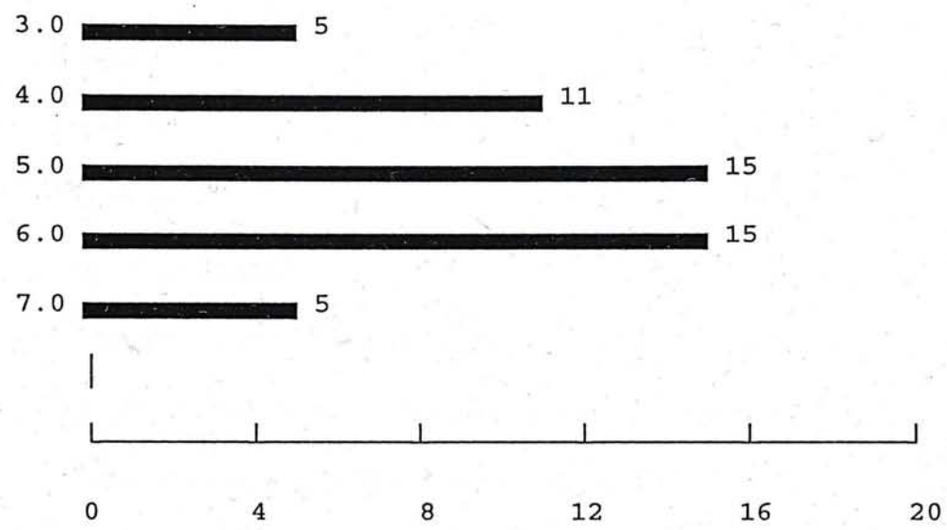
Fig 48 QPRACT 3.29 Quality practice reflects an emphasis on design



Valid cases 51 Missing cases 3

More than 50% of the respondents agreed to this statement. However 17 respondents don't think it really have any impact. 7 of the respondents think it have not impact at all.

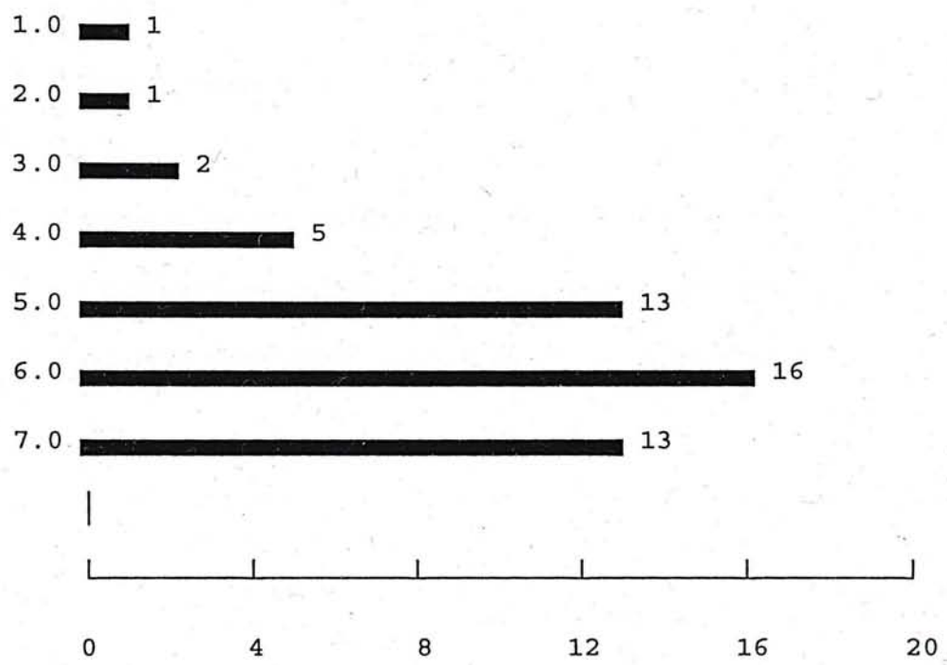
Fig 49 QCONFORM 3.30 Quality practice reflects an emphasis on Conformance



Valid cases 51 Missing cases 3

More than 70% of the respondents answered "Agree to Strongly Agree". Only 5 of them disagree.

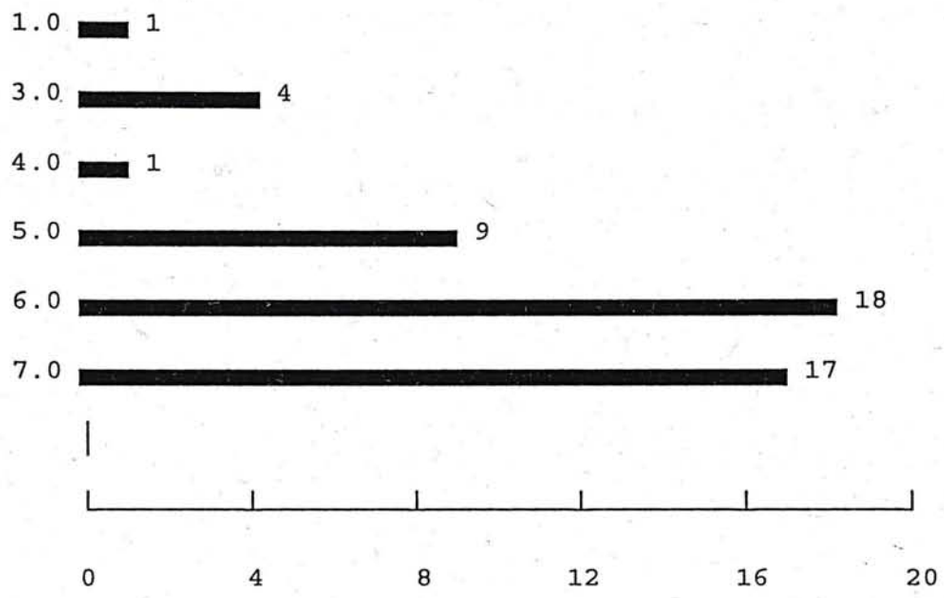
Fig 50 OTRAIN 3.31 Education and training address the knowledge and skills employees need to meet the quality objectives



Valid cases 51 Missing cases 3

More than 83% of the respondent agreed that training and education to employees are essential to quality improvement objectives. Only 3 respondents disagree. This match the recent trend of the industry: More emphasis have been placed on staff training than before.

Fig 51 OFABRICS 3.32 Material are passed through a series of lab-test before production



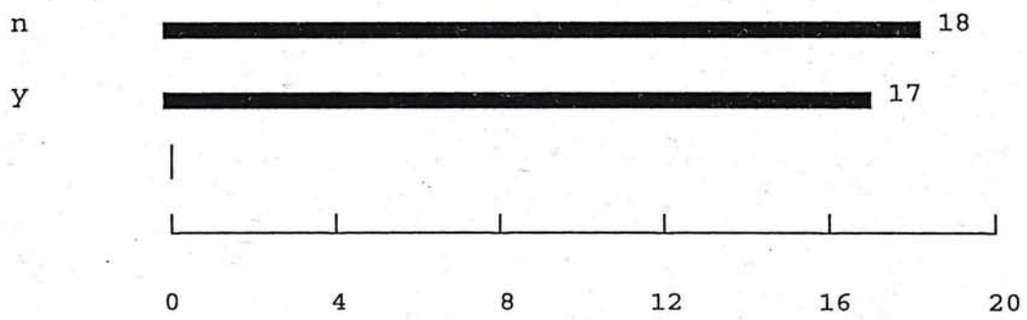
Valid cases 50 Missing cases 4

46 or 92% of the respondents agreed that this is a practice in their companies for quality control. However 6 or 12% of the respondents disagree.

Productivity Improvement Techniques

Productivity refers to the ratio of outputs over inputs. Productivity is improved by increasing sales(outputs), decreasing costs(inputs) or both. Productivity improvement is often used to mean reducing costs to provide the same or more sales. In this section the company's various approaches to improve productivity is stated.

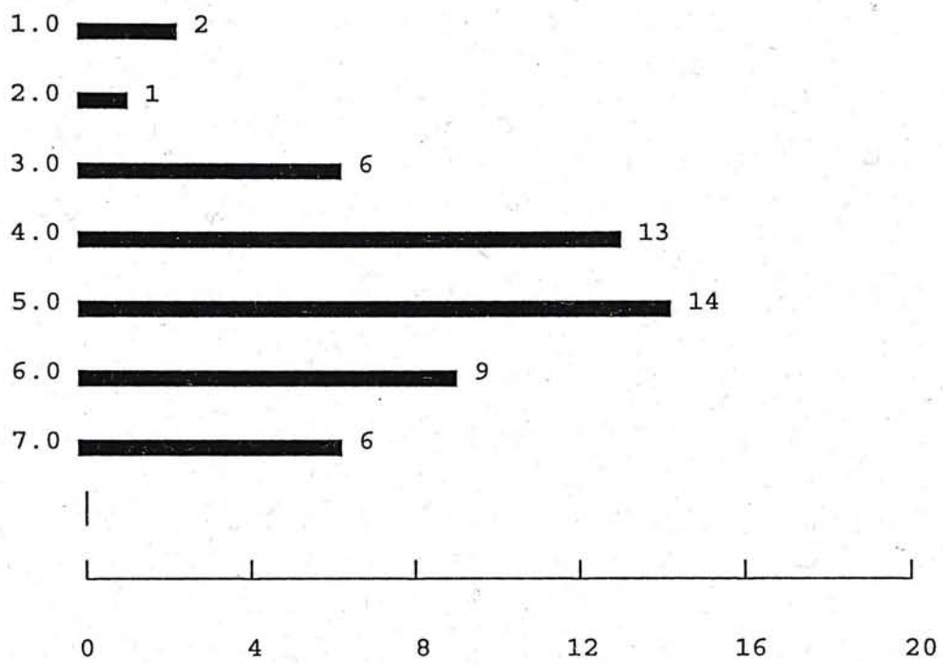
Fig 52 FORMQ 4.1 Our Company has a formal approach to productivity improvement



Valid cases 35 Missing cases 19

A relatively low respond rate is recorded to this question. The result is a fifty-fifty situation.

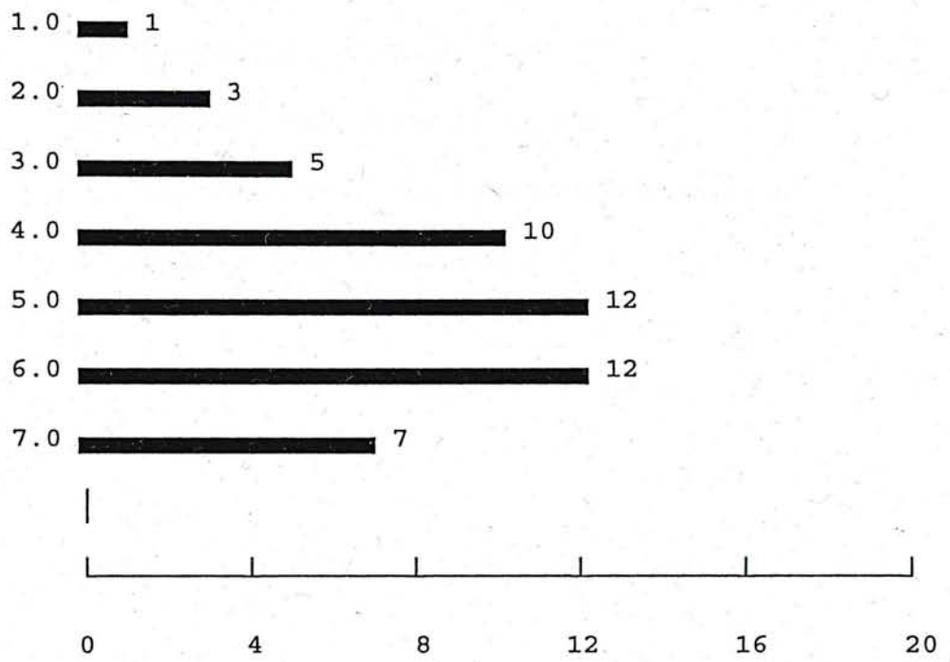
Fig 53 TRADENG 4.2 Application of Industrial Engineering techniques



Valid cases 51 Missing cases 3

29 or 60% of the respondents agree that Industrial Engineering techniques will improve productivity. However, 19% of the respondents disagree.

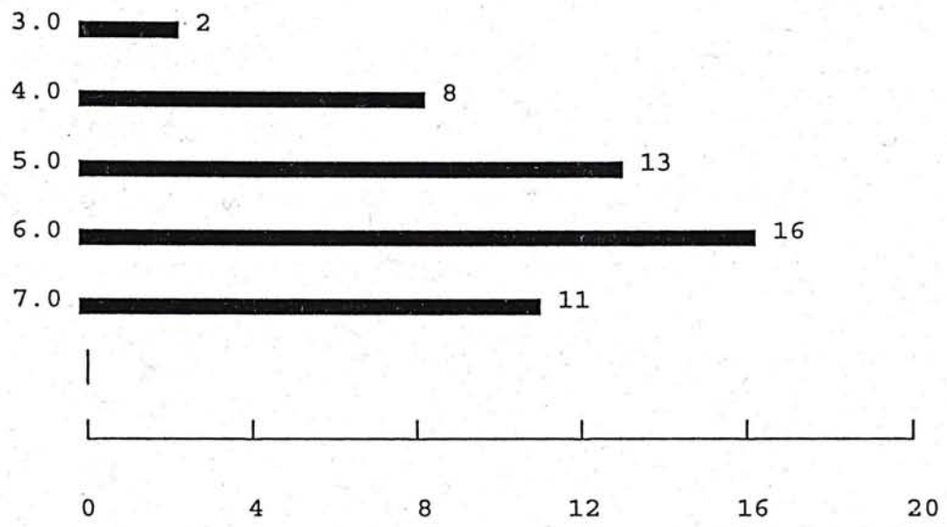
Fig 54 INVPLAN 4.3 Productivity improved by effective Inventory Planning



Valid cases 50 Missing cases 4

62% or 31 companies agreed that effective inventory planning improve productivity. 18% disagreed.

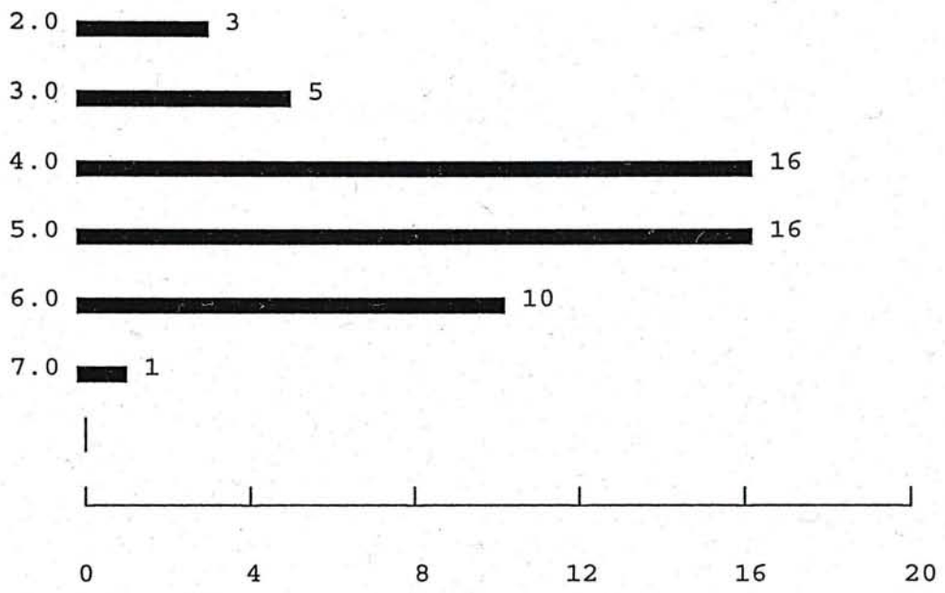
Fig 55 IMPROVEQ 4.4 Productivity improved by Improving quality



Valid cases 50 Missing cases 4

80% of the respondent answered "Agree to Strongly Agree" to this question. on 2 companies slightly disagreed.

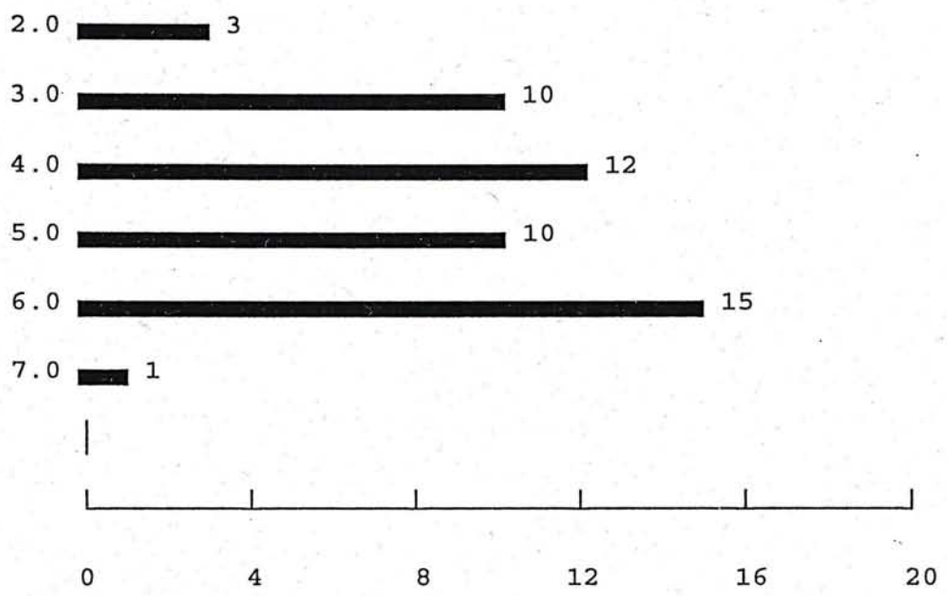
Fig 56 STRESEMP 4.5 Productivity improved by emphasis on Employee Selection



Valid cases 51 Missing cases 3

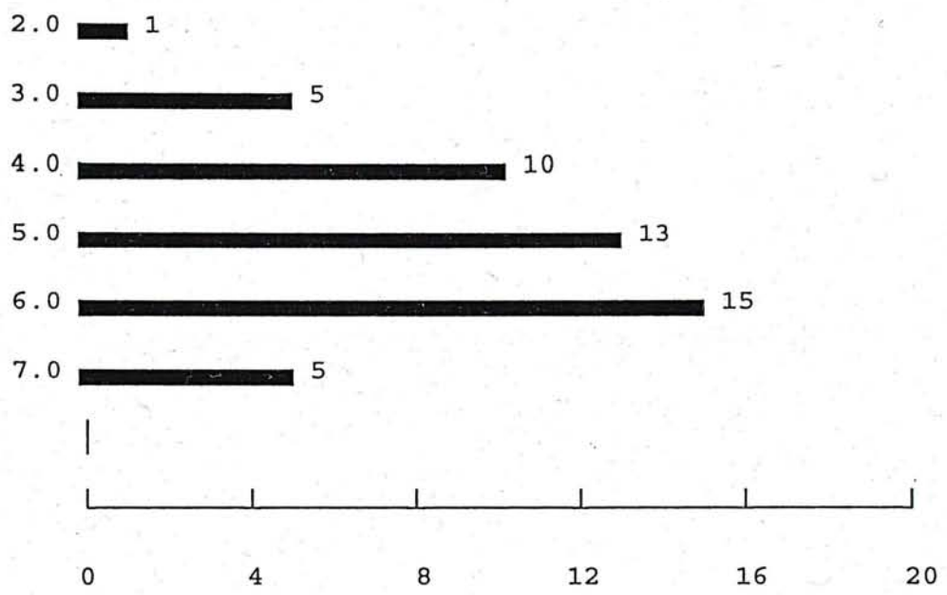
56% or 27 respondents agreed that productivity can be improved by emphasis on staff selection. However, this aspects is relatively lower than the other question in the same sections. This may be because of the relative labour intensive of the textile industry and the relative lower emphasis on education background in the industry.

Fig 57 DECENTRA 4.6 Productivity improved by decentralising of authority and responsibility



Valid cases 51 Missing cases 3

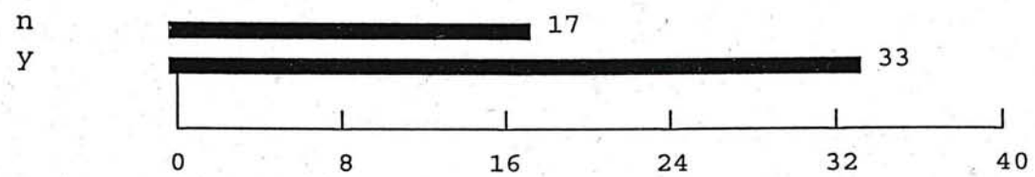
Fig 58 FEEDBACK 4.7 Productivity improved by providing feedback to employees



Valid cases 49 Missing cases 5

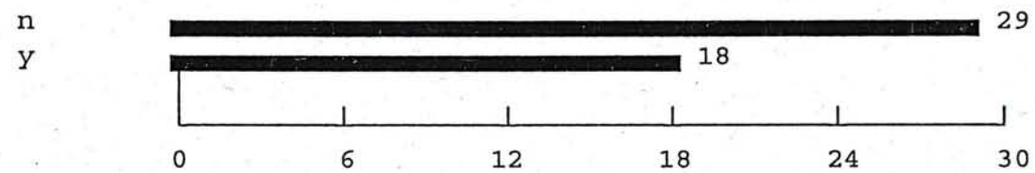
33 or 65% of the respondents answered "Agree to Strongly Agree". Only 5% answered "Disagree to Strongly disagree".

Fig 59 MATERIAL 4.8 Applying MRP



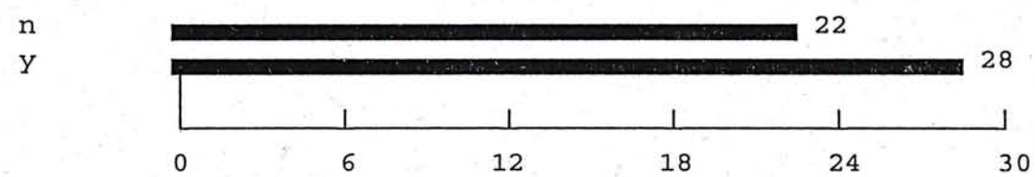
Valid cases 50 Missing cases 4

Fig 60 MANRESII 4.9 Applying MRP II



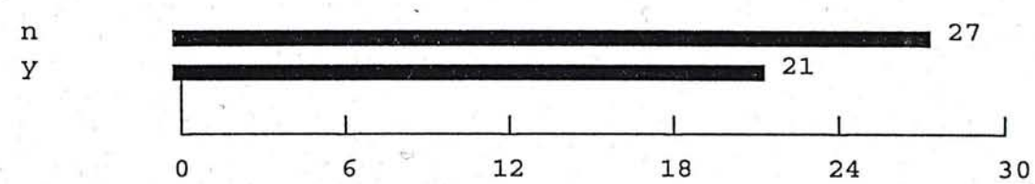
Valid cases 47 Missing cases 7

Fig 61 INTIME 4.10 Applying Just In Time



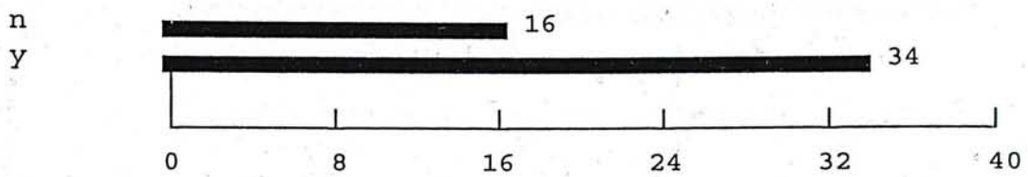
Valid cases 50 Missing cases 4

Fig 62 BENCHMRK 4.11 Applying Competitive Benchmarking



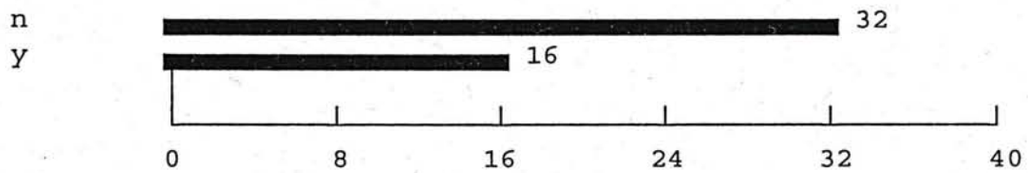
Valid cases 48 Missing cases 6

Fig 63 SELFDIR 4.12 Applying Self Direct



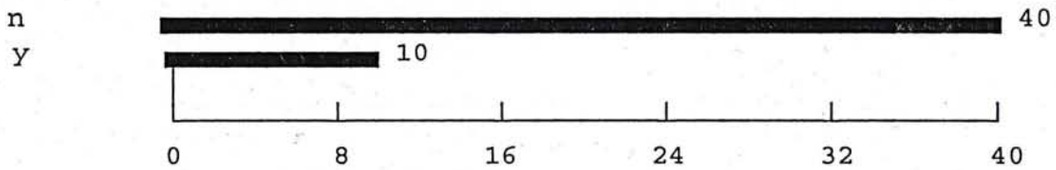
Valid cases 50 Missing cases 4

Fig 64 CONSTAIN 4.13 Applying Theory of Constraints



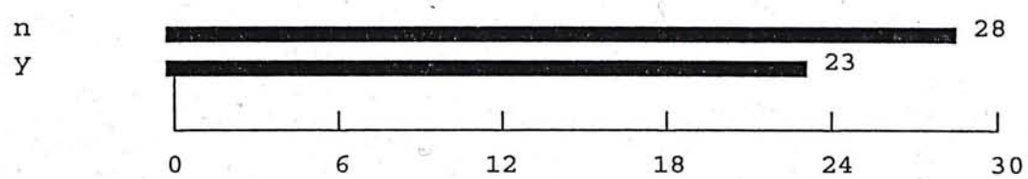
Valid cases 48 Missing cases 6

Fig 65 AUTODES 4.14 Applying Automatic Product Design



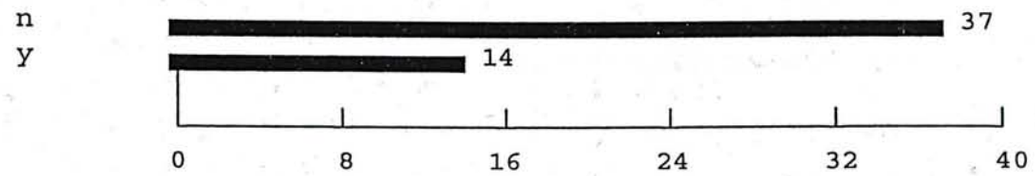
Valid cases 50 Missing cases 4

Fig 66 AUTOGRAD 4.15 Applying Automatic Grading



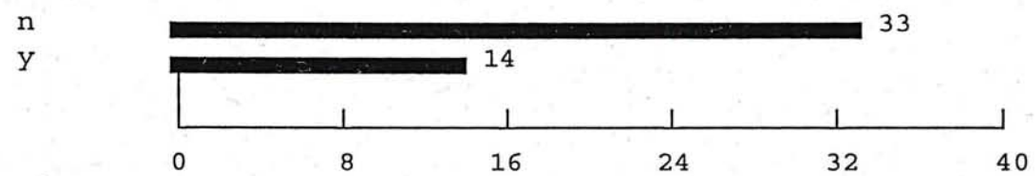
Valid cases 51 Missing cases 3

Fig 67 AUTOCUT 4.16 Applying Automatic Spreading



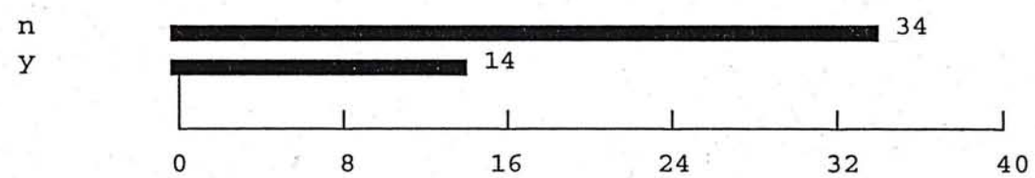
Valid cases 51 Missing cases 3

Fig 68 COMKNIT 4.17 Applying Computerised Knitting



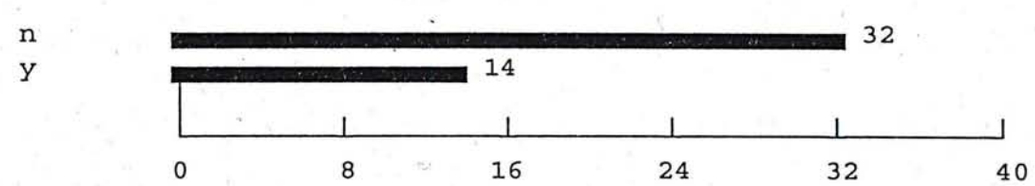
Valid cases 47 Missing cases 7

Fig 69 COMSEW 4.18 Applying Computerised Sewing



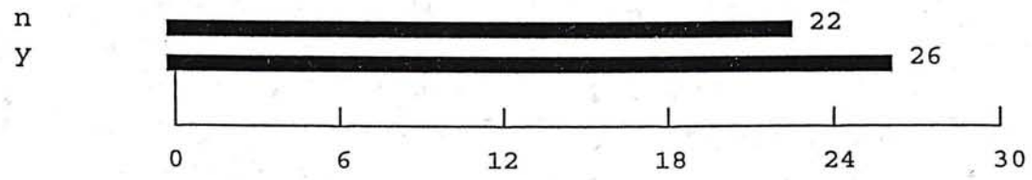
Valid cases 48 Missing cases 6

Fig 70 MODULAR 4.19 Applying Modular Production



Valid cases 46 Missing cases 8

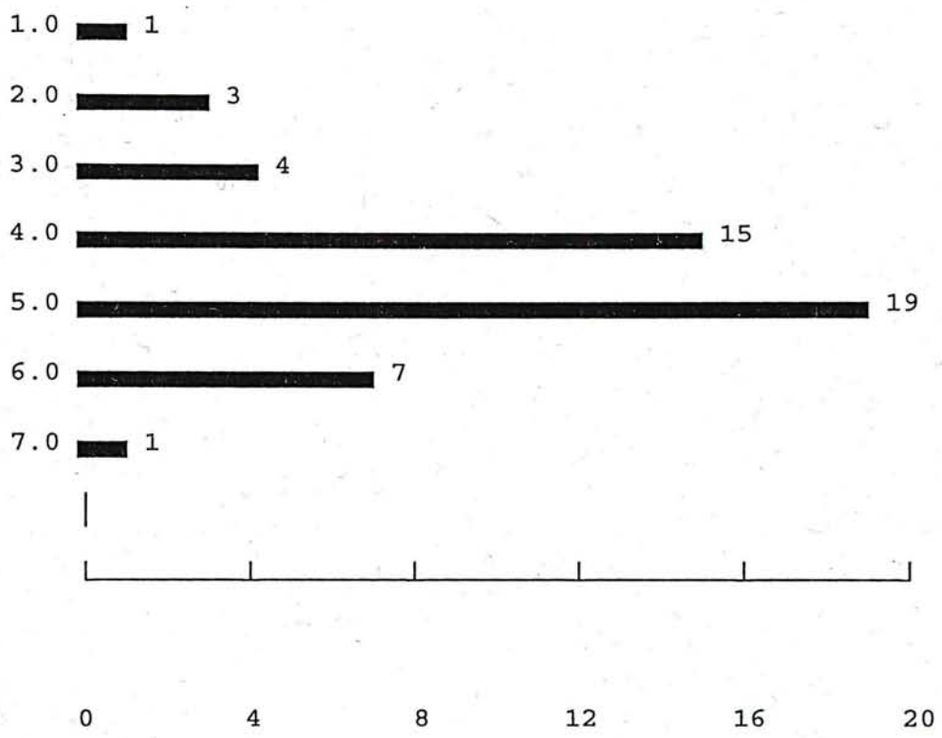
Fig 71 COMMGMT 4.20 Applying Computerised Management



Valid cases 48 Missing cases 6

Question 4-8 to 4-20 stated to show weather the respondents have applied the different productivity improvement techniques, namely, MRP, MRP II, JIT, Competitive Benchmarking, Self-directed work teams, Theory of Constraints, Automatic Product Design System, Automatic Grading and Pattern Making machine, Automatic Spreading and Cutting machine, Computerized Knitting machine, Computerised Sewing operations and Computerized Management system. From the above figures, we can see that these theories (4-8 to 4-13) are not very popular in the industry. However, among all these, MRP and MRP II are the most popular one even tough only 55% of the respondents are using it. Machine Automation and Computerization (4-14 to 4-20) is very unpopular too. Less than 30% of the respondents have been using these machines. This findings match with the general view the clothing industry has a low degree of computerisation.

Fig 72 EMPSATIS 4.21 Employee are satisfied with the company



Valid cases 50 Missing cases 4

Only one company has a response of "Strongly Agree". However, 54% of the respondents answered "Agree to Strongly Agree". 16% disagreed.

Further Analysis and Discussion

According to a study recently commissioned by Clemson Apparel Research, the new manufacturing technology to improve productivity, such as unit production and computer-aided design systems are sound investments for American clothing companies and will provide the companies a 300 percent return on investment and pay for itself in 11 months.

With above interesting information in mind, the primary interest in this research is to analyze the interrelationship among quality and productivity improvement factors and the company's performance in quality, productivity and finance and to find out if the same positive correlation can be derived in Hong Kong's local clothing industry. Factor Analysis are applied on the collected data to interpret the findings.

Factor Analysis

Factor Analysis is a statistical technique used to identify a relatively small number of factors that can be used to represent relationship among sets of many interrelated variables. It help us identify some underlying, not

directly observable, constructs. We use the SPPS/PC+ for Window system factor analysis routine for this analysis.

- - - - - - - - - - - - F A C T O R A N A L Y S I S - - - - - - - - - - - -

Analysis number 1 Listwise deletion of cases with missing values

Fig 73 Correlation Matrix of all questions:

	STAFFQ	SPC	RESP	MGMT	SOLVE	CRISIS	CUST
STAFFQ	1.00000						
SPC	-.09021	1.00000					
RESP	-.00083	.09576	1.00000				
MGMT	-.32747	.33031	.36163	1.00000			
SOLVE	-.39235	.40034	.31090	.53062	1.00000		
CRISIS	-.10680	.20910	.43677	.29663	.30998	1.00000	
CUST	.31129	.25012	.20806	.01044	.10970	.16142	1.00000
INSPECT	.33383	.20996	.09756	.07954	.02687	.18889	.49127
QPRACT	-.05126	.12004	.11932	-.07389	.24226	.05678	.24191
QCONFORM	-.00895	.10992	.07703	.12803	.25062	.36233	.29744
QTRAIN	.01497	-.02202	-.00693	.04744	.06784	.13176	.39642
TRADENG	-.02754	-.01766	-.21862	.17871	.16512	-.21075	.03159
INVPLAN	-.01194	.04146	-.01842	.30869	.33181	-.10136	-.06783
IMPROVEQ	-.09148	.21735	.40051	.44917	.59308	.20269	.23130
STRESEMP	-.03389	.09830	.24043	.24374	.09980	.22894	-.02406
DECENTRA	.25626	.16022	.15643	.01247	.13616	-.08214	.25607
FEEDBACK	-.10323	.00304	.13413	.42208	.27392	.18765	.05278
EMPSATIS	-.33383	-.02198	-.00922	.36088	.23253	.07574	-.06369

Correlation Matrix: (Continue)

	INSPECT	QPRACT	QCONFORM	QTRAIN	TRADENG	INVPLAN	IMPROVEQ
INSPECT	1.00000						
QPRACT	-.09792	1.00000					
QCONFORM	.20703	.58921	1.00000				
QTRAIN	.29164	.32069	.38627	1.00000			
TRADENG	.26395	-.06946	-.04345	.04103	1.00000		
INVPLAN	.23661	-.22965	-.22971	-.08808	.71931	1.00000	
IMPROVEQ	.10281	.24917	.37707	.14184	.37191	.41918	1.00000
STRESEMP	.12606	.02222	.23724	.09375	.25132	.37657	.37453
DECENTRA	.24695	-.07991	.04224	-.13163	.09705	.12339	.16607
FEEDBACK	.22723	-.17870	.13603	-.08910	.51955	.49862	.37692
EMPSATIS	.01516	.01307	-.04697	-.02757	.31014	.29130	.23323

	STRESEMP	DECENTRA	FEEDBACK	EMPSATIS
STRESEMP	1.00000			
DECENTRA	-.01568	1.00000		

Correlation Matrix: (Continue)

	STRESEMP	DECENTRA	FEEDBACK	EMPSATIS
FEEDBACK	.35336	.27858	1.00000	
EMPSATIS	.06240	.03919	.50409	1.00000

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .52237

Kaiser-Meyer-Olkin Measure

Sampling adequacy can be measured by Kaiser-Meyer-Olkin measure (KMO) which compares the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. Small values for the KMO measure indicate that a factor analysis of the variable may not be a good idea, since correlations between pairs of variable cannot be explained by the other variables. Kaiser (1974) characterize measures in the 0.90's as excellent, in the 0.80's as meritorious, in the 0.70's as middling and in the 0.60's as mediocre, in the 0.50's as miserable, and below 0.5 as unacceptable. [11]Since the value of the

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[11]Marija J Norusis. Statistics Guide. "Factor Analysis Procedure Factor" p129.[11]

overall KMO statistic in our survey is 0.52237 which can be classified as "miserable" and not suitable for factor analysis. We have tried to proceed to for the VARIMAX Rotation and it failed.

1-tailed Significance of Correlation Matrix:

' . ' is printed for diagonal elements.

	STAFFQ	SPC	RESP	MGMT	SOLVE
STAFFQ	.				
SPC	.28497	.			
RESP	.49791	.27316	.		
MGMT	.01713	.01632	.00931	.	
SOLVE	.00509	.00431	.02253	.00015	.
CRISIS	.25041	.09193	.00191	.02823	.02287
CUST	.02239	.05507	.09305	.47384	.24459
INSPECT	.01536	.09100	.26939	.30829	.43294
QPRACT	.37359	.22446	.22584	.32094	.06108
QCONFORM	.47757	.24417	.31388	.20953	.05470
QTRAIN	.46251	.44495	.48263	.38271	.33473
TRADENG	.43127	.45581	.08212	.12874	.14801
INVPLAN	.47009	.39716	.45392	.02335	.01591
IMPROVEQ	.28224	.08338	.00429	.00142	.00002
STRESEMP	.41565	.26786	.06255	.05991	.26472
DECENTRA	.05070	.15540	.16126	.46876	.19495
FEEDBACK	.25766	.49239	.19853	.00268	.03960
EMPSATIS	.01536	.44504	.47689	.00944	.06918

	CRISIS	CUST	INSPECT	QPRACT	QCONFORM
CRISIS	.				
CUST	.15356	.			
INSPECT	.11545	.00048	.		
QPRACT	.36048	.06136	.26863	.	
QCONFORM	.00919	.02787	.09417	.00002	.
QTRAIN	.20276	.00467	.03047	.01920	.00576
TRADENG	.09017	.42128	.04560	.33102	.39235
INVPLAN	.26150	.33476	.06569	.07173	.07168
IMPROVEQ	.09899	.07027	.25853	.05577	.00692
STRESEMP	.07237	.43988	.21317	.44446	.06517
DECENTRA	.30252	.05083	.05744	.30746	.39527
FEEDBACK	.11702	.36996	.07393	.12876	.19517
EMPSATIS	.31678	.34432	.46203	.46727	.38386

	QTRAIN	TRADENG	INVPLAN	IMPROVEQ	STRESEMP
QTRAIN	.				
TRADENG	.39821	.			
INVPLAN	.28955	.00000	.		
IMPROVEQ	.18512	.00765	.00286	.	
STRESEMP	.27742	.05420	.00698	.00727	.
DECENTRA	.20300	.27045	.21814	.14661	.46074
FEEDBACK	.28735	.00021	.00039	.00694	.01085
EMPSATIS	.43121	.02281	.03063	.06857	.34733

	DECENTRA	FEEDBACK	EMPSATIS

DECENTRA	.		
FEEDBACK	.03701	.	
EMPSATIS	.40267	.00033	.

Fig 74 - Statiscal Analysis of Eigen Value

Extraction 1 for analysis 1, Principal Components Analysis (PC)

Initial Statistics:

Q No.	Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*					
Q 3.5	STAFFQ	1.00000	*	1	4.03739	22.4	22.4
Q 3.6	SPC	1.00000	*	2	2.70504	15.0	37.5
Q 3.7	RESP	1.00000	*	3	2.11868	11.8	49.2
Q 3.8	MGMT	1.00000	*	4	1.55773	8.7	57.9
Q 3.9	SOLVE	1.00000	*	5	1.23744	6.9	64.8
Q 3.10	CRISIS	1.00000	*	6	1.08060	6.0	70.8
Q 3.27	CUST	1.00000	*	7	1.01332	5.6	76.4
Q 3.28	INSPECT	1.00000	*	8	.81493	4.5	80.9
Q 3.29	QPRACT	1.00000	*	9	.57753	3.2	84.1
Q 3.30	QCONFORM	1.00000	*	10	.57181	3.2	87.3
Q 3.31	QTRAIN	1.00000	*	11	.47995	2.7	90.0
Q 4.2	TRADENG	1.00000	*	12	.40544	2.3	92.2
Q 4.3	INVPLAN	1.00000	*	13	.38687	2.1	94.4
Q 4.4	IMPROVEQ	1.00000	*	14	.31093	1.7	96.1
Q 4.5	STRESEMP	1.00000	*	15	.26634	1.5	97.6
Q 4.6	DECENTRA	1.00000	*	16	.22070	1.2	98.8
Q 4.7	FEEDBACK	1.00000	*	17	.13715	.8	99.6
Q 4.21	EMPSATIS	1.00000	*	18	.07815	.4	100.0

PC extracted 6 factors.

VARIMAX rotation 1 for extraction 1 in analysis 1 - Kaiser Normalization.

VARIMAX failed to converge in 25 iterations. Convergence = .00046

CHAPTER IV

COMPARISON WITH HONG KONG'S MANUFACTURING INDUSTRY

Since we could not draw direct conclusion from the factor analysis, we have conducted a comparison of our findings in the clothing industry with the findings of a survey report on general manufacturing industry of Hong Kong conducted by two MBA students, Mr. Ricky Lam and Sheri Wong in 1994.*1 The same questionnaire was used in that survey and the data was analyzed and statistically acceptable. Hence a comparison between the clothing industry and the manufacturing industry of Hong Kong will be useful to provide some thought on the clothing industry we are studied.

In general, the sample mean and standard deviation of research in clothing industry are closed to that of manufacturing industry average, reinforce one phenomenon that clothing industry is the largest industry in the manufacturing sector hiring 34 percent of total manufacturing employment. Its characteristics are quite representing and matched with overall manufacturing industry.

Quality Performance

Figure 75 : Comparison on Quality Performance

(%)

Items	Clothing Industry			HK Manufacturing Industry		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
1 % of defective items	8.41	0.1	80	7.635	0	98
2 Waste / Scrap lost	6.24	0	30	4.643	2	50
3 Return cost	6.60	0	50	3.722	0	50
4 Rework cost	5.76	0	35	4.393	0	50
5 Training cost	4.98	0	30	4.19	0	50
Average	23.58%			16.94%		

The percentage of defective items and quality costs are significantly higher than the industry average. It reflects the unique nature of clothing manufacturing which is labour-intensive and depends heavily on the skifullness of labourer to make quality garments. One of the key characteristics is that quality of work will easily be deviated from standards when labourers work overtimes, in peak seasons, or without proper training and management support. Also correction on each single manufacturing defects is easier and less costly compared to that of other industries such as, electronic and plastic moulding etc. Both management and labourers tend to be less discipline on

following instruction and standard hence total quality costs in clothing industry sum up to be higher. Quality in Hong Kong's garment manufacturing is long perceived to be the best in the world by overseas customers. However, a frequently mentioned in the industry is that quality has started to deteriorate. It is believe that the current labour shortage is causing a decrease in quality and management is not as concerned about quality as they had been in the past.

Financial Performance

Figure 76: Comparison on Financial Performance

(%)

Items	Clothing Industry			HK Manufacturing Industry		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Net profit	10.61	-10	70	12.19	0	50
Return on assets	15.03	0	76.9	18.25	0	200
Return on assets - past three year	16.14	-0.5	87	16.37	0	150
Sales growth past three years	1.75	-300	100	20.21	-20	149.7

The sample means in clothing industry are all lower than the industry average reflect a very bad but real situation in the clothing industry. Hong Kong economy is now undergoing a structural change from a manufacturing centre of light industry to a service industrial centre. Started from 1993 and the first time since 1955, domestic exports of clothing dropped significantly at 16.7 percent per annum. It is not surprising to find out that sales of some manufacturers dropped 300 percent in past three years, and on average, sales growth of the industry was 1.75 percent. In our previous report indicates the number of establishment continuously dropped for the past seven years reflects the industry is under great stress but no longer a prosperous and profitable business. It is heart that the

bankruptcy rate of clothing manufacturers is the highest in the country during these few years partially because of poor economic situation in overseas markets and partially because of the accelerating factory rents , material costs and labour wages.

Other Quality and Productivity Achievement

Figure 77:Principal component analysis - factor matrix

	Clothing		Manufacturing	
	Mean	S.D.	Mean	S.D.
Factor 1				
3.27 CUST	5.64	1.336	5.397	1.374
3.28 INSPECT	5.32	0.978	4.733	1.527
3.29 QPRACT	4.765	1.29	4.992	1.411
3.30 QCONFORM	5.078	1.146	5.298	1.221
3.31 QTRAIN	5.51	1.362	5.481	1.459
Factor 2				
4.20 TRADENG	4.706	1.46	5.084	1.393
4.30 INVPLAN	4.86	1.512	5.237	1.419
4.40 IMPROVEQ	5.52	1.129	5.527	1.181
4.50 STRESEMP	4.549	1.154	4.626	1.378
Factor 3				
3.70 RESP	4.72	1.213	4.748	1.411
3.80 MGMT	5.154	1.274	5.687	1.166
3.90 SOLVE	4.627	1.232	5.084	1.302
Factor 4				
4.60 DECENTRA	4.529	1.317	4.542	1.489
4.70 FEEDBACK	5.041	1.241	5.198	1.263
4.21 EMPSTATIS	4.46	1.187	4.794	1.196
Factor 5				
3.50 STAFFQ	3.962	1.771	3.565	1.946
3.60 SPC	3.725	1.588	4.198	1.705
Factor 6				
3.10 CRISIS	4.471	1.433	4.641	1.699

Comparison is further conducted on following six factors, each of which covers a group of related questions and is interpreted as a measure on common idea or practice on quality and productivity achievement.

Factor 1

It refers to a set of questions: 3.27, 3.28, 3.39, 3.30 and 3.31 in the questionnaire attached in the appendix. It is interpreted as a measure of a company's ability to understand customer requirement and produce and service these requirements. Sample means in questions 3.27 and 3.38 are particular above the industry average that explain the result of historical development of " Original Equipment Manufacturing". Clothing manufacturers depend heavily on buyers assistance on quality assurance and technical support. It is a common industry practice that both domestic and foreign buyers send their own inspector to clothing factories to carry out at least three inspections during pre-production, in-line and final stages to assure quality of garment be conformed.

Factor 2

It is interpreted as the behavioral, engineering and

accounting productivity interventions used by the company and represented by questions: 4.2, 4.3, 4.4 and 4.5. The sample mean of these four questions are all below industry average slightly, imply that clothing industry is still labour-intensive compared to other manufacturing industries in Hong Kong and clothing manufacturers do not extensively apply modern technology to improve productivity. It matches with the research result in question: 4.9 to 4.20 which reflects below 28 percent of clothing manufacturers apply soft and hard technology in their production plants. This phenomenon will be further explained later in the interviews.

Factor 3

It is interpreted as the company's ability to recognizing the need of quality improvement and involving all employees including management in the quality improvement practice. It is represented by question: 3.7, 3.8, and 3.9. The finding in this factor echoes the comparison in factor 2. Compared to the general manufacturing industry, the involvement and commitment of management of clothing manufacturers in quality improvement are significantly low.

Factor 4

It is interpreted a behaviourial productivity

interventions and represented by question: 4.6, 4.7 and 4.21. The sample means of first two questions are closed to the industry average as Hong Kong's labourers are famous for their initiative and self-consciousness in continuous improvement of business career and personal development regardless of difference in their industries and responsibilities. However, the measurement on employee's satisfaction with company in clothing industry is lower than that of general manufacturing industry may be sarcastically interpreted as a subtle reflection of employee's insecurity and uncertainty in a declining industry.

Factor 5

It is interpreted as some formal approach to quality improvement such as having some standard or some standardized procedure for quality control and quality assurance and represented by question: 3.5 and 3.6. Both sample means and standard deviation of clothing industry are significant lower than industry average imply most respondents agree that clothing industry apply no formal quality approach in quality improvement. Details of informal quality approach will be further discussed in Chapter V.

Factor 6

It is represented by question: 3.10 and a measure of crisis based quality improvement practice. Attention and improvement on quality is done primarily after a failure. The sample mean of clothing industry is lower than industry average. This phenomenon may be affected by industry's inspection system as explained before that most buyers conduct numerous in-line production inspections, a lots of potential defects can be detached earlier to avoid a final failure or crisis.

CHAPTER V.

Findings in Interview

Given the statistical result is not fully satisfactory, we further supplement our research by conducting interviews with 2 of the respondents. We have visited two clothing factories and discussed with Ms. Cammy Ng, the Senior Manager of Glorious Sun Group and Mr. Andrew Chan, the Proprietor of Hinbase Limited on their strategies and practices on quality and productivity improvement in their factories. Their comments have some common similarities and drastic controversies but in general reflect the characteristics of most clothing factories in Hong Kong. Their opinions also explain a lot of phenomena in our postal survey. We sincerely thank Ms. Ng and Mr. Chan for their times spent with us and valuable inputs to our study.

Background of the Factory

Glorious Sun Group,

The Glorious Sun Group founded in 1971 by the Yeung family has been developed to a conglomerate with more than 80 companies with a combined annual turnover of about US$400 million and a total production of over 20 millions pieces. Its main activities include manufacturing of fabrics and apparel products , trading and retailing and property investment with factories in Hong Kong, China, Philippines, Indonesia and Bangladesh. The group started as a manufacturer of Jeans and has expanded to production of knitwear & woven apparel for both men and ladies. It is one of the biggest manufacturers and exporters in Hong Kong. In addition, it develops its own distribution and retail networks in the United States, Canada and Australia. Over the years, Glorious Sun Group has established its own corporate philosophy. So as for its employees to understand the importance of achieving their goals in work and life, it continues to improve on their working environment, to provide adequate training and to offer competitive rewards. Its management philosophy consists of five phases, namely planning, organization, delegation, leadership and education.

Hinbase Limited

After working in garment firms for more than 15 years, and acquiring in depth knowledge and experience in clothing manufacturing, Mr. Andrew Chan set up his own factory in 1990 with three partners. The head office with total 45 staff locates in Kwun Tong carries out mainly non-manufacturing activities such as communication with customers and materials suppliers , product development and material sourcing. Production activities in Hong Kong are contracted to 20 sewing machines for small orders requiring quick deliveries, whereas the key production plant locates in South China-Panyu province with total 350 sewing machines generates annual sales up to HK$ 60 million.

Quality Achievement

Both factories agree that today customers demand higher quality than before and the continue success of a clothing factory is to firstly conform the raising quality standards demanded by buyers. Basically, the quality of a garment produced in the same plant is quite consistent but nothing related to its selling price or label carried at back neck. That means if a garment for a budget discounter and that for a high-end designer are produced in the same plant, the quality of these two garments will not have

significant difference.

Quality of these two factories are highly perceived by their customers and their internal waste and scrap costs as a percent of dollar sales are limited to 1.5% to 3%. However, their approaches to assure and improve quality are quite diverse. One follows an informal approach whilst the other one has a formal systematic approach. The major differences are :

Informal Approach

Action is quite reactive and correction will only be taken after crisis. Statistical process control is mainly used to measure and count the outputs in each work-in-processes and finished product. Production planning is based on historic figures and management experience. The management admit that very often the production planning is not accurate and overtime work and subcontracting are necessary to meet delivery schedule. The quality assurance system implemented within the production plant heavily depends on management commitment and their daily involvement in production lines, plus a sound reward-penalty remuneration system and the abundant supply of labourers.

It is a common industry practice in clothing industry that assembly lines are separated into subsections of which each section is responsible to inspect the quality of the semi-products produced by the former section. Salary will be deducted from the sewers or quality inspectors in the former section when any defective produces are detached by the member in the successive section. Hence quality performance of each labourer in the former section is checked consequently by the successive sections. An automatic cross-checking system is formed between workers and among different sections to assure quality standards be followed.

The management also emphasize on hiring skilled and semi-skilled labourers to keep up with the production progress. The under-performed workers committed repeated errors will be fired after several warnings. Thank to the abundant supply of labourer in the Pearl River Delta region, the management can terminate an under-performed worker and easily replace it by a skilled or semi-skilled worker who can immediately fit into the sewing lines without formal training or delaying production. The management believe above quality control measures in the short run are easy to manage and require least resources but yield the greatest flexibility and efficiency that are

the key survival factors of a small factory in a fierce competitive environment.

Formal Approach

Action is proactive and precaution is focused. Employee's awareness of quality is widely stimulated through out the entire production processes by extensive training programs, seminars among departments and encouragement from top management. Quality control circles are formed to assure buyer's quality requirements be conformed. Computerized statistical process control is widely used to provide an accurate picture of each production processes to top management planning down to the daily control of individual sewing lines by foreman.

The management believe that the implementation of a formal quality control system greatly depends on both the external and internal situation. Internally, when planning production schedule, the management should group production of similar styling within the same production line and standardize production processes of garments within a plant. In market, there is a general preference toward doing business with large companies .In most cases, retailers will repeatedly place orders in similar styling on a continuous basis with a particular manufacturer once

they satisfy with the quality performance of the current order. Also, larger companies are more likely to own quota and have capacity to do large initial orders or increase to meet demand for larger reorders. Above internal and external forces, in turn provide more accurate forecast on sales and production within the company and facilitates long term planning and investment.

Quality Certification

In market, it is not clear if adopting the European-driven ISO 9000 will be necessary to do business in future. Some believe that it is a need to do it although they do it with great difficulty and tremendous times and efforts. Whereas quite a lots of manufacturers hardly give ISO 9000 a second thought as it is still new to Hong Kong local manufacturers. In Hong Kong, as of to date, there are two clothing companies are certified. One of these two companies is Glorious Sun Group with which we conduct a detailed interview. Glorious Sun has a long tradition of formal approach in quality improvement and invest heavily in contemporary computer-aided manufacturing system. They spent two years time and received consultancy support from Hong Kong Polytechnique University to get certified in 1994. They believe that supreme quality standard and

continuous improvement in quality will be the key factor to sustain their competitive niche in global clothing market.

Productivity Improvement

During the whole process of our study, we have constantly asked ourselves a question if the increase in productivity either in reducing costs or increasing output resulted from both improvement in manufacturing processes plus investment in equipments can offset the rising labour wages and land costs in Hong Kong clothing factories . Based on the result of our postal survey, 43 companies out of 53 set up production plants in offshore countries seem to imply that moving production plants to other low-cost countries are one of the common and practical survival strategies of a labour-intensive industry.

Production bases of both factories we interviewed are no longer in Hong Kong and their sewing machines in Hong Kong are mainly for counter sampling purposes further materialize our thinking.

Traditional Cost Reduction

The management of one factory feel skeptical if the return on investment in expensive automatic machineries and computerized system in improving management processes such as Unit Production System, Computerized Aided Design, Automatic Cutting Machines and Manufacturing Resources Planning II, etc will cover initial investment costs.

Instead, they emphasize the cost advantage of cheap labour and flexibility of using simple sewing machineries.

A new single needle sewing machine costs HK$3000 per unit, a new overlocking machine costs HK$8000 whereas a flatlocking machines costs HK$16,000. A total investment of HK$ 2 million can buy 350 sewing machines for an annual output 800,000 pieces at dollar sales HK$60 million. Initial investment can be covered within two years time at 10% net profit on total sales and as long as orders are flown in continuously. Basic machineries have greatest adaptability and flexibility to various styling from fancy to simple and different fabrications. It is very crucial in today competition as size of orders is smaller and number of bodies increases.

To avoid potential problem of production deadlock in particular process during peak season, the management prefer to buy additional 20% of machineries to be sit and waited within the plant and hire extra workers when needed instead of a detailed study on improving manufacturing processes beforehand or investment in modern machineries. Sub-contracting again is still a favourable mean and practical solution to increase flexibility and for additional capacity under strong quality guidance of the parent company.

Industrial Engineering and Process Analysis

Other viewpoint is that increasing productivity does not necessarily mean finding cheap labour. Continuous expansion to low-cost countries finally reaches a limit and will create problem of spreading the core management and resources too thin. Say for an example to increase the production by 10%, a company may normally produce 10,000,000 pieces annually, an 10% increment is equivalent to 1,000,000 pieces that implies a new factory with 400 sewing machines is being opened and additional investment in machineries at HK$ 2.5 million is needed. One solution to increase efficiency and improve the consistency of product standards is to raise output in the existing plant by streamlining the logistics and paperwork, reducing inventory and work-in-process, employing automatic system in grading and pattern making to save costs from hiring a sewer to single inch of fabric.

However, one key advantage for big factory over small one to employ modern machineries and management system is big factory usually has sufficient capital, manpower and consistent orders to support long term investment. Small factories, due to their financial constraints, fluctuated market demand, limited exposure to modern technology and

management theories, feel risky and uncomfortably to invest in contemporary computer-aided manufacturing system and modern machineries which are new and unfamiliar to them.

Market Pressure

The top management of both factories hold a serious attitude in dealing customer complains especially on quality. They actively involve in handling each complain and believe that in today buyer market, customer complains will have a direct negative impact on sales and deteriorate their negotiating power to take new orders. In clothing manufacturing, specifications are normally set up by buyers who will send their own inspectors to the factories to assure requirements and specifications be conformed during the production processes. Buyers will not tolerate nonconforming manufacturers and orders will be easily switched to other better managed manufacturers without a prior notice. Poor managed factories will not have a chance to get a repeated order.

Management Commitment

Both factories agree with our finding in the postal survey that management commitment is the key factor to assure customer's quality requirement be conformed. The top-down pressure is the driving force but major problem to implement full scale quality system in the production plant is the ignorance in the lower operational levels. The top and middle management should have the initiative and understand the importance of quality improvement. However, convincing people all the way down the line to the sewers and operators will be the key of success. Top management of the Glorious Sun group has committed heavily on training the operational labourers and office personnel to improve their skills and work cohesively towards company goals through internal training courses and external seminars.

CHAPTER VI

CONCLUSION

Hong Kong's clothing industry, the world leading exporter of clothing, with 45 years of development, started from scratch, reached a peak in 1980's and now start losing its twinkling in local economy. Our study, with particular interest in this industry, is to understand what type of quality and productivity improvement practices are used and how quality and productivity improvement factors relate to actual quality, productivity and financial performance.

Compared to domestic industry average, clothing industry is still labour-intensive and small in size. Majority of clothing manufacturers apply little advanced soft and hard technology in quality assurance and productivity improvement.

A slight regret in our study is that due to time and manpower constraints, we do not have sufficient respondents to the postal survey to derive a statistically significant relationship among the quality and productivity improvement factors and actual quality, productivity and financial performance.

QUESTIONNAIRE

A SURVEY OF YOUR COMPANY'S QUALITY IMPROVEMENT PRACTICES

Every company strives to generate and deliver high quality products and services to their customers. Yet, approaches toward quality achievement and actual quality achievement vary among companies. This survey seeks to identify you company's approach and achievements regarding quality. Questions ask for your opinions, feelings, beliefs, and in a few instances, actual achievements regarding quality improvement at your company. There are no right or wrong answers. You or your company's identity is not required to complete this survey.

PART ONE : COMPANY DEMOGRAPHICS

In this questionnaire, we focus on the "company" in Hong Kong. Please answer all the question referring to the operation in Hong Kong only. Simply answer for the unit you are most familiar with either the company as a whole or the division in which you work.

1.0 Does your company have other branches or subsidiaries in China or overseas which is related to Hong Kong? Please specify site, _____
_____

1.1 The business nature of the company is (e.g. manufacturing, trading, etc.)
_____

1.2 The type of products in this division/company is (e.g. woven, knitted, fur, leather etc.)
_____

1.3 The number of employees in HK operation is approximately _____

1.4 The annual employees turnover rate, i.e., the number of permanent employees terminating last year over the average number of employees last year, in the company was _____
_____

1.5 The key criteria used to serves a manager performance in this company is _____
_____

1.6 Company sales last year were approximately _____

1.7 This company has been in business for approximately _____ years.

1.8 The percent of employees now involved in quality improvement activities and training in this company is _____ %.

		Strongly Disagree			Neither Agree Nor Disagree			Strongly Agree
1.9	I am familiar with various quality program such as zero defects, quality circles, statistical process control, etc.	1	2	3	4	5	6	7
1.10	I have read books and articles, attended seminars, or sought outside expertise or consultants in the quality area	1	2	3	4	5	6	7
1.11	Overall, my knowledge of the quality area is comparable to that of managers at similar levels in other companies	1	2	3	4	5	6	7

1.12 My job title is _____

1.13 My duties included _____

PART TWO: COMPANY PERFORMANCE

		Strongly Disagree			Neither Agree Nor Disagree			Strongly Agree
	In general, our customers							
2.0	Demand quality	1	2	3	4	5	6	7
2.2	Receive the quality they expect from our company	1	2	3	4	5	6	7

		Poor			Average			Good
2.3	Receive our company's past year quality performance as	1	2	3	4	5	6	7
2.4	Receive quality performance from our company over the past year is	1	2	3	4	5	6	7

QUALITY PERFORMANCE can be measured as expressed in a number of ways. At my company, over the past year, the .....

2.5 Percent of items defective in our production process is _____ %.

2.6 Internal waste/scrap cost as a percent of dollar sales was _____ %.

2.7 Returns and warranty or adjustment costs as a percent of dollar sales was _____ %.

2.8 Rework as a percent of dollar sales was _____ %.

2.9 Training and development expenditures as a percent of dollar sales was _____ %.

Similar to quality, FINANCIAL PERFORMANCE can be measured in a number of ways. At my company .....

2.10 Last year's net profit as a percent of dollar sales was _____ %.

2.11 Last year's return on assets, i.e., net profit divided by assets, was _____ %.

2.12 The past three years' average return on assets, i.e., net profit divided by assets was _____ %.

2.13 The past three years' average percent sales growth (decline) was _____ %.

PART THREE: QUALITY IMPROVEMENT TECHNIQUES

3.1 Would you say that your company has a formal approach to quality improvement? If yes, please explain

_____

_____

3.2 If your company has a formal approach to quality improvement, for how many years has it existed?

_____

_____

3.3 Does your company currently have a separate quality department? (Yes/No) _____

3.4 How many staffs are currently employed in the quality department? _____

		Strongly Disagree			Neither Agree Nor Disagree			Strongly Agree
	QUALITY IMPROVEMENT at this company is best described as							
3.5	Applying no formal approach.....	1	2	3	4	5	6	7
3.6	Applying statistical process control (SPC)	1	2	3	4	5	6	7
3.7	Each employee's responsibility behavioral in nature	1	2	3	4	5	6	7
3.8	Management's involvement and responsibility	1	2	3	4	5	6	7
3.9	Identifying and resolving improvement projects	1	2	3	4	5	6	7
3.10	Crisis based; attention and improvement primarily after a failure	1	2	3	4	5	6	7
3.11	Reward focused; pay for quality performance	1	2	3	4	5	6	7

3.12 Applying quality control circles ..... Yes / No

3.13 Applying quality control 7 tools ..... Yes / No

3.14 Applying Taguchi Method ..... Yes / No

3.15 Applying 5S .....Yes / No

3.16 Applying fool-proof (poke yoke) ..... Yes / No

3.17 Applying quality function deployment.. Yes / No

The company is familiar with the following scholars/consultants in quality management.

3.18 Edward Deming .....Yes / No

3.19 Joseph Juran .....Yes / No

3.20 Philip Crosby .....Yes / No

3.21 Kaoru Ishikawa .....Yes / No

QUALITY IMPROVEMENT - ISO 9000

3.22 Is your company certified as a ISO 9000 producer? .....Yes / No

3.23 If your answer in question 2.22 is "Yes", please check the certificate received and state the year being certified.

( ) ISO 9001 - received in
( ) ISO 9002 - received in
( ) ISO 9003 - received in

3.24 If your answer to question 3.22 is "No", is your company interested in applying for ISO 9000? Please check the correct answer.

Interested in: ISO 9001 _____ ISO 9002 _____ ISO 9003 _____ Not interested

3.25 When does your company apply for ISO 9000?

Within 1 year _____ Within 3 years _____ Others, please specify
Not decided yet _____

3.26 Have you planned to use your own staff or to hire consultant to plan and implement ISO 9000?

Own staff only _____ Consultant only _____
Own staff and consultant _____ Others, please specify

		Strongly Disagree			Neither Agree Nor Disagree			Strongly Agree
	Quality products and services depend upon the degree to which a company (1) understands and specifies customer requirements (design) and (2) produces and services these requirements (conformance). AT MY COMPANY							
3.27	Customers' opinions and views regarding their needs are actively sought through direct contact; buyers' sample and size specs and so forth	1	2	3	4	5	6	7
3.28	There are a number of inspectors who try to assure we conform to specifications	1	2	3	4	5	6	7

		Strongly Disagree			Neither Agree Nor Disagree			Strongly Agree
3.29	Quality practice reflects an emphasis upon design	1	2	3	4	5	6	7
3.30	Quality practice reflects an emphasis upon conformance	1	2	3	4	5	6	7
3.31	Quality education and training programs address the knowledge and skills employees need to meet the quality objective associated with their responsibilities	1	2	3	4	5	6	7
3.32	Materials and fabrics are passed through a series of lab-test before production	1	2	3	4	5	6	7

PART FOUR: PRODUCTIVITY IMPROVEMENT TECHNIQUES

Productivity refers to the ratio of outputs over inputs. Productivity is improved by increasing sales (outputs), decreasing costs (inputs) or both. Productivity improvement is often used to mean reducing costs to provide the same or more sales.

4.1 Would you say that your company has a formal approach to productivity improvement? Explain _____

_____

		Strongly Disagree			Neither Agree Nor Disagree			Strongly Agree
	Productivity can be improved by introducing behavioral, engineering, and accounting practices. At my company PRODUCTIVITY IS IMPROVED BY							
4.2	Traditional industrial engineering applications: process flow analysis, work measurement, standards, layouts, and so forth	1	2	3	4	5	6	7
4.3	Effective inventory planing and control ..	1	2	3	4	5	6	7
4.4	Improving quality	1	2	3	4	5	6	7
4.5	Stressing employee biographical data in employee selection; work history, education references, and so forth	1	2	3	4	5	6	7
4.6	Decentralizing; placing responsibility, authority, and decision-making at lower levels in the organization	1	2	3	4	5	6	7
4.7	Providing objective feedback to employees on performance; providing quantities, quality, and achievements against goals and directions received	1	2	3	4	5	6	7
4.8	Applying Material Requirement Planning...		Yes / No					
4..9	Applying Manufacturing Resources Planning II		Yes / No					
4.10	Applying Just in Time		Yes / No					
4.11	Applying competitive bench marking		Yes / No					
4.12	Applying self-directed work teams		Yes / No					
4.13	Applying theory of constraints		Yes / No					
4.14	Applying automatic product design system		Yes / No					
4.15	Applying automatic system in grading and pattern making		Yes / No					
4.16	Applying automatic spreading machine and cutting process		Yes / No					

4.17 Applying computerized knitting machines ..... Yes / No

4.18 Applying computerized sewing operations ..... Yes / No

4.19 Applying modular production system ..... Yes / No

4.20 Applying computerized management system ..... Yes / No

	Strongly Disagree			Neither Agree Nor Disagree			Strongly Agree
4.21 Base on my company's surveys, Employees AT MY COMPANY ARE SATISFIED WITH THE COMPANY	1	2	3	4	5	6	7

----- END ------

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